UNIVERSIDAD COMPLUTENSE DE MADRID
FACULTAD DE GEOGRAFÍA E HISTORIA

TESIS DOCTORAL

Public Works and the Spanish Colonial Agenda of Sanitation, Order, and Social Control in the Late Eighteenth-Century to Nineteenth-Century Manila

(Las obras públicas y la política española de sanidad, orden y control social en Manila desde finales del siglo XVIII al XIX)

MEMORIA PARA OPTAR AL GRADO DE DOCTOR

PRESENTADA POR

Ros Costelo Ávila

Directora

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For the Filipinos,
who wish to know and learn from our history

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ABSTRACT

In the late eighteenth to the nineteenth century, Manila first witnessed its first phase of intensive urbanization and development bolstered by the social and economic transformations and the ballooning of its population. The heightened city movement and rapid city growth produced varied problems of sanitation, order, and control and posed challenges to the administration of the colonial capital. Moreover, the spread of infectious diseases and waves of cholera epidemic aggravated the city´s condition. During this time, increased public works were introduced by the Spanish colonial government in Manila to bring solutions to the growing urban needs and problems of the colony.

This dissertation attempts to interrogate how the Spanish empire´s ideas of a modern rational State were translated and demonstrated through the public works projects in Manila. It examines the new urban layout through specific infrastructures such as street works projects and public lighting, waterworks, slaughterhouse and markets, and cemeteries in the Spanish colonial capital. Utilizing these public works as case studies, I argue that these projects became structural symbols of empire as colonial authorities and urban reformers interspersed through these structures the Spanish colonial agenda of public sanitation, order, and social control.

This study presents the colonial public works projects as a lens by which Manila´s urban transformation and (re)configuration as a colonial city could be displayed and analyzed. Ideas of public health and urban hygiene heavily influenced the conception, design, and construction of Manila´s colonial built environment in the late eighteenth to the nineteenth century. Moreover, this research examines the infrastructure projects as they became spaces of governance and surveillance. The laws and decrees implemented to regulate the use and functions of these urban landscapes provide a glimpse of the colonial government´s view on governmentality and authority. These regulations produced varied responses from Manila´s diverse racial and socio-economic communities, thus converting the public works projects as urban spaces of encounter, contestation, and negotiation in the colonial city.

The dissertation is composed of seven chapters. The first three chapters highlight the actors, institutions, processes, and policies that were involved in the carrying out of colonial infrastructures. The remaining chapters present four case studies of public works projects as major examples of the modernizing ventures of the colonial government during the period. This research heavily relies on materials culled from the Spanish archives of the Archivo General de Indias and the Archivo Histórico Nacional as well as the National Archives of the Philippines (NAP).

Keywords: colonial Manila, urban history, public works, sanitation, social control

RESUMEN

Desde finales del siglo XVIII al siglo XIX, Manila experimentó su primera fase de urbanización y desarrollo intensivo sostenido por las transformaciones socio-económicas y el aumento de su población. El movimiento y crecimiento rápido de la

ciudad condujo a múltiples problemas de saneamiento, orden y control, y plantearon desafíos a la administración de la capital. La propagación de enfermedades infecciosas y la epidemia de cólera empeoraron las condiciones de la ciudad. Durante este periodo, el gobierno colonial español llevó a cabo diferentes proyectos de obras públicas para solucionar las crecientes necesidades urbanas y diversos problemas de la colonia.

Esta investigación cuestiona cómo la idea del imperio español de una colonia moderna y racional se tradujo y se evidenció a través de los proyectos de obras públicas en Manila. Mediante el estudio de varios casos prácticos como la conducción del agua, las calles públicas, el alumbrado público, los mataderos y los mercados públicos y los cementerios, la tesis examina cómo esos proyectos se convirtieron en "símbolos visibles del imperio", en los que las políticas fueron racionalizadas y desarrolladas de acuerdo al marco colonial de sanidad, orden y control social.

Este estudio expone los proyectos de obras públicas como una lente por la cual se puede mostrar y analizar la transformación y configuración urbana de Manila como ciudad colonial. Las ideas de higiene y salud pública influyeron significativamente en la concepción, diseño y construcción de su entorno urbano. Examina también los decretos implementados para controlar el uso y las funciones de esas infraestructuras y cómo se convirtieron en espacios de gobernabilidad y vigilancia. Las normas dieron lugar a variadas respuestas de las diversas comunidades raciales y socio-económicas de Manila, transformándose los proyectos de obras públicas en espacios urbanos de encuentro, contestación y negociación.

La tesis se compone de siete capítulos. Los tres primeros capítulos destacan los actores, instituciones, procesos y políticas alrededor de la realización de infraestructuras coloniales. Los capítulos restantes tratan cuatro casos prácticos como ejemplos principales de los emprendimientos modernizadores del gobierno colonial durante el periodo. Esta investigación se basa principalmente en las fuentes extraídas de los archivos españoles del Archivo General de Indias y Archivo Histórico Nacional, así como del Archivo Nacional de Filipinas.

Palabras claves: Manila siglo XVIII-XIX, historia urbana, obras públicas, sanidad, control social

INTRODUCTION

About the Study

In 2013, highly-acclaimed fiction writer Dan Brown described Manila in his novel *Inferno* as the ¨gates of hell¨- ¨the most densely populated city on earth¨ characterized by ¨six-hour traffic jams, suffocating pollution [and] chaotic and crowded streets¨.[1] This depiction of the city provoked infuriating remarks against the writer, especially among reactive and hypersensitive Filipino politicians.[2] Unfortunately, Brown was only stating the obvious for his portrayal of Manila was definitely not out of touch. In the city´s contemporary history, urban decay, filth, disorder, shortage of modern infrastructures, and uneven development have spoiled the city´s story of expansion and growth. This grim picture was exacerbated by the alarming environmental and catastrophic threats as different technical studies have declared Manila as one of the world´s ¨riskiest cities to live in¨.[3] Despite the amplifying calls for urban renewal and demands of the city dwellers for well-organized transportation and communication systems, efficient and functional urban services, and well-ordered and scientific metropolitan planning, the ¨hopes and nightmares¨[4] of the city´s urban future is a serious, urgent concern that all stakeholders need to grapple with.

In 2019, the local chief executive of Manila won the mayoralty race in the city based on his campaign promise of bringing in a *Bagong Maynila* or *Renewed Manila*- a crusade that would make the old city clean, vibrant, and organized again. In his first week of office, the mayor, reported the cleaning, ordering, and ¨declogging of the arteries of Manila¨ which included the ¨previously chaotic streets of Recto (formerly called Azcarraga), Divisoria, Soler, and Carriedo¨. Messy streets and sidewalks were cleared from ambulant vendors and itinerant markets. Gamblers in public spaces were apprehended. Truckloads of wastes were collected from the city´s different districts. City facilities and establishments without proper water and sewerage facilities and garbage

[1] Dan Brown, *Inferno* (New York: Anchor Books, 2013), p. 269.
[2] ¨Manila upset at Dan Brown´s ´gates of hell´ line in *Inferno*,¨ *The Telegraph,* 23 May 2013; ¨Brown hounded for calling Manila ´gates of hell´¨, *Philippine Daily Inquirer,* 24 May 2014.
[3] Bong Lozada, ¨Metro Manila is world´s second riskiest city to live in,¨ *Philippine Daily Inquirer,* 27 March 2014.
[4] This term was also used in Charles Choguill, ¨Manila: City of Hope or a Planner´s Nightmare,¨ *Built Environment*, 27, 2, (January 2001): 85-95.

disposal systems were suspended. Site inspections in the city´s estuaries or *estero*s and areas prone to flooding were undertaken. Green spaces like the Manila Botanical, parks, zoos, and public areas were revisited conveying a promise of reinvigorated green and open spaces for the city.[5] Months after, the campaign for a sanitized and ordered city proved to be a difficult task. The need to continue to make a living resulted to the recongestion of streets dealers and sellers, piled-up trash and rubbish in public spaces, and the varied images of the old, unclean, and disorderly city.

The desire to create a clean and orderly Manila is an aspiration that seemed distant and unreachable. For the past two decades, the previous administrations centered on bringing cleanliness, order, and vigor to the old, disarrayed, and deteriorating capital. City slogans ¨*Buhayin ang Maynila*¨ (Revive Manila), ¨*Linisin, Ikarangal ang Maynila*¨ (Clean, Be Proud of Manila), ¨Forward Ever, Backward Never¨ were launched by the local government in the hopes that these would usher a new city mentality and propagate a renewed image for the once-adored capital. After all, other younger cities in the Metro had already eclipsed Manila´s prestige and progress. During the dictatorial regime of Ferdinand Marcos in the 1970s and 1980s, ¨urban renewal and city development¨ of Manila was used as propaganda to justify the authoritarian rule and create a façade of material progress and splendor to conceal its excesses and abuses. Meanwhile, in the early decades of the twentieth century, the urban problems of a growing Manila and the new city configuration and urban planning that was unveiled in the capital was used as a backdrop of American exceptionalism.

During the second half of the Spanish rule in the archipelago, Manila first witnessed its first phase of intensive urbanization and development bolstered by the social and economic progress and the ballooning of its population. The heightened city movement and activity eventually posed severe challenges to the administration of the colonial capital. The city´s growth gave rise to varied problems of sanitation, order, and control. The city became a site of contamination, infection, and disorder. Manila´s deteriorating urban situation became a major cause of concern for colonial administrators. These concerns were aggravated as different infectious diseases and waves of cholera epidemic ravaged the islands at the time. Undeniably, the problems of agglomeration, insalubrity,

[5] ¨A preview of ´Bagong Maynila´? Isko Moreno´s first week in office,¨ *Rappler*, 6 July 2019.

and chaos came hand in hand with the promise of advancement and development. To bring solutions to the growing urban needs and problems of the capital, increased public works were implemented by the Spanish colonial government in Manila during this epoch.

In the late eighteenth and nineteenth century, new notions of progress and modernity were introduced in the colony. This dissertation attempts to interrogate how the Spanish empire´s ideas of a modern and rational State were translated and demonstrated through the public works projects that it carried out in Manila. The reformist tone of the eighteenth-century Enlightenment, which were continued and intensified with the nineteenth-century global, imperial, and local transformations, the creation of the Liberal state, the expansion, urbanization, and transformations of global cities, the emergence of new notions of progress, the laying out of infrastructures through emerging know-how and technologies, the development of new ideas in sanitation, hygiene, order, and social control characterized the period.

Ravi Ahuja posited that before the eighteenth century, ¨public works¨ was first used as a loose term for ¨a range of related social practices which include state buildings, contemporary facilities for ¨public use¨ constructed by the State or by municipalities, and to infrastructures with a distinct religious connotation, that is, as ¨public works of piety¨. In the eighteenth century, the concept evolved as it referred to ¨gentlemanly¨ bourgeois-aristocratic ethical notions of ¨improvement¨. By the nineteenth century, he argues that the term ¨public works¨ would be seen not only as the result of the improving dynamics of private property aided by the State, but also as the property of a nation, as facilities ¨for the use not of particular individuals but of any of the whole mass of individuals composing the nation who may be in a position to take advantage of them.¨ This nineteenth-century concept would be reaffirmed in the creation of government branches institutions that were specialized in the planning, execution, and management of public works. [6] In Manila, the Inspección General de Obras Públicas was created in 1866 but other technical specialized institutions preceded it in the earlier decades.[7]

[6] Ravi Ahuja, *Pathways of Empire: Circulation, ¨Public Works¨ and Social Space in Colonial Orissa 1780-1914 New Perspectives in South Asian History,* vol. 25 (Hyderabad: Orient BlackSwan, 2009), pp. 82-84.
[7] Ros A. Costelo, ¨´Construyendo la Colonia´: La Inspección General de Obras Públicas de Filipinas¨, Trabajo Final del Máster en Historia Contemporánea, Universidad Complutense de Madrid, 2016.

This dissertation examines Manila´s new urban layout through specific public works projects. In this case, the study principally focuses on the street works projects and public lighting, cemeteries, slaughterhouse and public markets, and waterworks and the introduction of a sewerage system in the Spanish colonial capital. Utilizing these public works as case studies, I argue that these projects became structural symbols of empire as colonial authorities and reformers interspersed through these structures the Spanish colonial agenda of public sanitation, order, and social control.

Manila, as people know it today, is hardly distinguishable from its origins as an old Spanish colonial city in the sixteenth to the nineteenth century. The ¨Manila¨ of the late eighteenth to the nineteenth century is now just a small part of the present-day megalopolis.[8] Over the centuries, the capital has grown into an enormous city in terms of extension, expanse, and population. Today, it records a population of 12 million inhabitants and reaches up to 15 million during daytime work.[9] Yet, the multi-layered and complex problems of a megacity that it is today somehow resemble the challenges of the old capital when it first witnessed unprecedented population growth and rapid urbanization during the last century of Spanish rule in the archipelago.

The terms ¨Manila¨, ¨capital¨, ¨city¨ are used in this investigation to designate the colonial urban sprawl which consisted of the walled city or *Intramuros* and the growing communities beyond the walls or *Extramuros.* The maps and printed sources that were consulted in this investigation interchangeably used the terms *ciudad* (city)*, plaza* (military stronghold)*,* and *Intramuros* to refer to the walled city while the words *contornos* (outskirts)*, arrabales* (suburbs)*,* pueblos (towns) and *extramuros* were used to signify the different surrounding districts in the late eighteenth to the nineteenth century. Through time, *Intramuros* has remained the static and traditional political, religious, military, and judicial seat of colonial power. The governor-general´s palace, cathedral of the capital, centers and schools of the different religious orders, military offices and barracks, and the highest court were all situated inside the walls. It also served as a place

[8] Metro Manila is now composed of sixteen cities and one municipality, each municipality has its own local government units headed by a Mayor. The cities comprise Caloocan, Malabon, Navotas, Valenzuela, Quezon City, Marikina, Pasig, Taguig, Makati, Manila, Mandaluyong, San Juan, Pasay, Parañaque, Las Piñas, and Muntinlupa and the lone municipality of Pateros.
[9] ¨National Quickstat for 2020*,¨ Philippine Statistics Authority*, 2020.

of residence of the small Spanish population in the capital. On the other hand, the *Extramuros* consisted of the communities divided into two geographic locations: first, the more bustling settlements on the right bank of the Pasig river which consisted of Tondo, Binondo, Santa Cruz, Quipo, Trozo, San Miguel, and Sampaloc and second, the communities on the left river bank composed of San Fernando de Dilao/ Paco, Ermita, and Malate. These suburbs represented the dynamic and consistently-evolving environs of the city where economic activities and industries were located and the highly heterogeneous population of the city converged. In more than a century and a half, these settlements would experience immense changes in its urban fabric and composition.

This study presents the colonial public works projects as a lens by which Manila´s urban transformation and (re)configuration as a colonial city could be displayed and analyzed. Ideas of public health and urban hygiene heavily influenced the laying out of the colonial built environment in the late eighteenth to nineteenth-century Manila. The creation of a new urban design for the suburbs, the widening, cleaning, clearing, and lighting of streets, the construction of cemeteries away from the populated areas of the city, the introduction of modern architectural and physical design for slaughterhouses and markets, the establishment of the first network of waterworks system and the introduction of the sewerage system were intersected and entangled with the imperial concepts of how cities were conceived, designed, and constructed.

Moreover, this dissertation examines the infrastructure projects as they became spaces of governance and surveillance. Laws, decrees, declarations, and edicts were rationalized and implemented to regulate the use and functions of these infrastructures and urban landscapes. Through these legal apparatuses, a glimpse of the colonial government´s view on governmentality, authority, lawfulness, and criminality could be provided. This research used these urban decrees and norms to interrogate the colonizers´ vision and definition of what a sanitized, orderly, and controllable citizenry meant in the context of Manila´s urban colonial life.

The application of laws and regulations produced varied responses from Manila´s diverse racial and socio-economic communities, thus converting the public works projects as urban spaces of encounter and contestation in the colonial city. Here, both the macro and micro-level perspective in the development of Manila as a colonial city is

analyzed. The study attempts not only to reconstruct the structural, institutional, and legal transformations in the urbanizing colonial city as well as reimagine the everyday lives of Manila´s inhabitants as they moved their way around the spatial changes brought by the public works projects. Through this, we hope to understand how the heterogeneous Manila population negotiated with the changing urban environment through time.

This research hopes to contribute to the deeper understanding of Manila´s urban growth and the social-environmental-ideological challenges that went through it. Through its chapters, it aims to provide some of the answers to these questions:

1. What colonial problems and challenges did the public works projects embody?
2. How did these projects represent the ideas and visions, triumphs and achievements as well as the weaknesses and limitations of the empire?
3. What do these public works endeavours tell us about the policies that the Spanish administration established in the Philippines?
4. Utilizing these infrastructures, how can we analyze the changing views, attitudes, and technologies concerning public sanitation, order, and the built environment through time?
5. How can the interplay of policies and people´s responses aid in understanding the metamorphosis of Manila as a complex and multi-layered city?

Literature Review

Imperial and Global Transformations

Understanding the dynamics in the Spanish metropolis and the Spanish empire, in general, is a cornerstone in this research. Works that deal with the development of Spanish urbanization are vital in constructing correlations and resemblances as well as gaps and discontinuities in the development of ideas and policies with regard to city construction and governance.

José María Cardesín Diaz and Jesús Mirás Araujo proposed a tripartite periodization of the process of Spanish urbanization: first, was the period of Enlightenment reforms (1746- 1833); second, was the end of the Ancient Regime, state articulation, and capitalist development (1833-1936); and the third consisted of the Civil

War period to the first decade of the 21st century.[10] This research takes interest in the first two periods and asks, Were the changes in concepts and plans concerning urban planning in the metropolis affected the Spanish colonial cities like Manila?

Carlos Sambricio´s *Territorio y Ciudad en la España de la Ilustración* is indispensable to this research because it provides solid theoretical ideas and practical examples in understanding Spanish urbanism and how its concept of enlightened urbanism manifested in public works projects in the metropolis.[11] The Enlightened urbanism of the second half of the eighteenth century was characterized by ¨urban police regulations [that involved] hygiene measures (street drainage, waste disposal), ordinances on extramural cemeteries, lighting, and public order, [and] city beautification policies involving urban design, regulation of the facades, street alignments¨ etc.[12]

Ideas concerning public health and urban hygiene greatly influenced the conception, design, and construction of Spanish cities in the eighteenth century which would persist in the following century. These convictions penetrated the realm of policies, institutions, and laws that endeavored the creation of salubrious cities and the formation of healthy populations. For instance, the excellent works of Gerard Jori showed the interconnection of the medical and sanitary debates that dominated eighteenth-century Spain and the creation of specialized institutions and the promulgation of sanitary laws and regulations. Jori postulated that these sanitation ideas gave birth to the ¨medicalization of urban spaces¨ and provided a framework in the laying out of new urban design for Spanish cities.[13] Pedro Fraile´s number of works complement this body of knowledge. He proposes that Spanish urbanism during this period was an epoch of *policy science,* wherein mechanisms of government vigilance and control on the quotidian aspect were institutionalized to shape the habits and attitudes of the citizens. These

[10] José María Cardesín Diaz and Jesús Mirás Araujo, ¨Historic Urbanization Process in Spain (1746-2013): From the Fall of the American Empire to the Real Estate Bubble,¨ *Journal of Urban History* vol. 43, 1 (2017), pp. 33-52.
[11] Carlos Sambricio, *Territorio y Ciudad en la España de la Ilustración* (Ministerio de Obras Públicas y Transportes, Instituto del Turismo y Urbanismo, 1991). See also: Francisco Singul, *La Ciudad de las Luces. Arquitectura y Urbanismo en Santiago de Compostela Durante la Ilustración* (Santiago de Compostela: Consorcio de Santiago, 2001).
[12] Cardesín Diaz and Mirás Araujo (2017), p. 36.
[13] Gerard Jori, ¨Población, Política Sanitaria e Higiene Pública en la España del Siglo XVIII,¨ *Revista de Geografía Norte Grande,* 54, (2013), pp. 129-153.; Salud Pública e Higiene Urbana en España durante el Siglo XVIII. Una Perspectiva Geográfica, Doctor of Philosophy Dissertation, Universitat de Barcelona, 2012.

strategies of domination and control brought the consolidation of municipal administration geared towards the organization of cities and bringing solutions to the city´s varied concerns from ¨street pavement to sanitation, lighting and identifying the location of service infrastructures like cemeteries and markets as well as contested places such as taverns and brothels.[14]

The nineteenth-century aspirations of liberalism and modernity would inspire the urbanization project and affect the carrying out of infrastructure works during the establishment of the Liberal State until the years of Restoration. This second phase which characterized nineteenth-century Spanish urbanization involved ¨institutional reforms, development of liberal municipalities, and centralization¨ which gave way to urban plans that ¨approximated European urbanism¨.[15] Fernando de Terán demonstrated that these waves of urban planning and infrastructures reforms that were instituted in Spain consequentially brought impact in the overseas territories.[16] In order to carry out the projects of urbanization, sufficient number of engineers with specialized knowledge and skills were necessary. Silva Suarez argued that the institutionalization of the different branches of civil engineering was part of the reforms in nineteenth century Spain which was characterized by the creation of specialized schools and more intensive scientific training.[17]

The period also saw the beginnings of more elaborate and comprehensive plans for the new urban configuration and expansion of big cities such as the Cerda Plan (1857) for Barcelona and Castro Plan (1860). Madrid, for instance, experienced modern urban transformations during this time as a consequence of the Liberal State´s progressive reforms as shown in the study of Luis Enrique Otero Carvajal and Rubén Pallol Trigueros.[18] A recent publication on the development of cities in the southern Spanish region of Andalusia also used the same framework in the development of modern

[14] Pedro Fraile, *La Otra Ciudad del Rey. Ciencia de Policía y Organización Urbana en España* (Madrid: Celeste, 1997).; ¨Putting Order into the Cities: The Evolution of ´Policy Science¨ in Eighteenth-Century Spain,¨ *Urban History,* 25 (May 1998), pp. 22-35.
[15] Cardesín Diaz and Mirás Araujo (2017), p. 37-38.
[16] Fernando de Terán, *Historia del Urbanismo en España III Siglos XIX y XX* (Madrid: Cátedra D.L.,1999).
[17] Manuel Silva Suarez, (ed.), *Técnica e Ingeniería en España V. El Ochocientos Profesiones e Instituciones Civiles* (Zaragoza: Real Academia de Ingeniería, 2007).
[18] Luis Enrique Otero Carvajal and Rubén Pallol Trigueros, ¨El Madrid Moderno, Capital de Una España Urbana en Transformación, 1860-1931,¨ *Historia Contemporánea,* 39 (2009), pp. 541-588.

networks of infrastructures of water supply, gas, electricity and lighting, and transportation and communication.[19]

The political, social, and economic transformations of the period witnessed the conception and construction of modernizing infrastructures in the peninsula. For example, Juan Manuel Mates, in his several studies on the waterworks systems in Spain, argued that the liberal legislations throughout the nineteenth century empowered the municipal governments and increased the participation of private sectors in the establishment and management of waterworks system in Spain. One of the earliest laws was the Municipal Instruction of 1813 (*Instrucción Municipal de 1813)* which ordered municipalities to launch appropriate measures to organize water supply to their populations while the Law of Public Works on 13 April 1877 (*Ley de Obras Públicas*) indicated that all waterworks were under the the local government´s responsibility.[20] He adds that these legislations were heavily pushed by the hygienist engineers and doctors of the time.[21] The role of these sectors as carriers and supporters of the reform and development of cities was crucial in articulating the importance of modern infrastructure projects in confronting and solving the cities´ urban and sanitary problems.[22]

However, this tone of reform and development was critically challenged by Elena and Ordoñez in their investigation on the state of science and technology in Spain in the nineteenth century. They argued that the educational infrastructures, like the establishment of specialized schools for engineering came in too late. As a result, Spain had to rely on the technology, materials, and knowledge of foreign experts in building and operating modern infrastructures.[23] Utilizing the cases of Cuba and the Philippines, Elena and Ordoñez tried to show the efforts of Spain to introduce science and technology

[19] Mercedes Fernández Paradas (coord.), ¨La ciudad moderna,¨ *Andalucía en Historia,* no. 68 (July 2020).
[20] Juan Manuel Matés-Barco, ¨El servicio público de abastecimiento de agua en España (siglos XIX y XX): El proceso de acumulación de competencias de los Ayuntamientos,¨ *Revista Brasileira de História & Ciencias Sociais-RBHCS,* vol. 9, no. 18 (Julho-Dezembro de 2017), pp. 45-46.; ¨El servicio de abastecimiento de agua potable: estado de la cuestión,¨ *Transportes, Servicios y Telecomunicaciones,* nº 1 (2001), pp. 147-150. Some of the other laws passed included the *Ley de 3 de febrero de 1823, Ley de Ayuntamiento de 1845, Ley Municipal de 1877, Ley de Obras Públicas de 1877,* and the *Ley de Aguas de 1879* etc.
[21] Juan Manuel Matés-Barco, ¨La regulación del suministro de agua en España: siglos XIX y XX,¨ *Revista de Historia Industrial,* nº 61, Año XXV (2016), p. 20.
[22] E. Rodriguez and A. Menéndez, ¨Salud, trabajo y medicina en la España del siglo XIX. La higiene industrial en el contexto anti-intervencionista,¨ *Arch Prev Riesgos Labor* 8, 2, (2005), pp. 58-63.
[23] Alberto Elena y Javier Ordoñez, ¨Science, Technology, and the Spanish Colonial Experience in the Nineteenth Century,¨ *Osiris,* vol. 15 (2000), p. 75.

into its last remaining colonies but its inability to fully integrate science and technology into its own culture reflected in its incapacity of modernizing the colonies.

Uncovering the experience of other colonial cities that were once part of the Spanish empire or cities that formerly belonged to the British, French, or Dutch empires are also effective points of comparison in this research. The introduction of Bourbon sanitary reforms to improve the colonial cities´ urban hygiene and public health concerns can be considered a widely-explored subject matter in Latin American historiography. Some of these excellent works include Adriana Maria Alzate Echeverri´s study on New Granada and Macarena Ibarra´s examination of the case of Santiago de Chile.[24] In the case of San Juan, Puerto Rico, Crowe argued that public works developed in the island in the second half of the eighteenth century to the nineteenth century due to four factors: (1) the recognition from both the local and imperial administration that there is a need for public works development; (2) the presence of economic support to finance the public works; (3) the existence of a specific need for a public work; and (4) that public works are seen as responses to environmental conditions.[25]

The emerging ideas on urbanization and public works, sanitation and hygiene, order and control were definitely not exclusive to the Spanish empire as demonstrated in the insightful exploration and inquiry of Cristopher Bayly and Jürgen Osterhammel in understanding the global transformations in the late eighteenth to the nineteenth century. The period which was marked by heightened intersections, confluences, and linkages as well as rapid and interconnected transformations signaled to what Bayly terms as the ¨birth of the modern world¨.[26] Osterhammel expanded it as an ¨age of changes and novelties, of rapid human mobility and technology¨.[27] One of the characteristics that they highlighted in this period was the spread of new way of urban living. According to Osterhammel, no other age had experienced such a spatial densification of social existence. The growth of the urban population accelerated in comparison with earlier

[24] Adriana Maria Alzate Echeverri, *Suciedad y Orden. Reformas Sanitarias Borbónicas en la Nueva Granada 1760-1810* (Bogotá: Editorial Universidad del Rosario, 2006); Macarena Ibarra, ¨Hygiene and Public Health in Santiago de Chile´s Urban Agenda 1892-1927¨, *Planning Perspectives,* vol. 31, no. 2 (2016) pp. 181-213.
[25] Monica Lyn Crowe, *Rise of Public Works and Sanitation in San Juan, Puerto Rico, 1765-1823*, Master´s Thesis, Florida International University, 2012.
[26] C.A. Bayly, *The Birth of the Modern World 1780-1914 Global Connections and Comparisons* (United Kingdom: Blackwell Publishing, 2005).
[27] Jürgen Osterhammel, *The Transformation of the World. A Global History of the Nineteenth Century* (Princeton and Oxford: Princeton University Press, 2014), pp. 244-245.

centuries. With this development, city infrastructures were constructed. New streets were paved, railroads, street lights were installed, and sewerage systems and water utilities were constructed. In short, in the nineteenth century, the city became "modern" and modernity came into being in the city. It is in this context of intense global modernization and urbanization that we will examine the changes in Manila´s city life.

The experiences of Hong Kong, Vietnam, India- former British and French colonies in Asia also demonstrate the complex intersection of environmental and sanitary concerns in the planning and re-creation of colonial cities as shown in the book *Imperial Contagions: Medicine, Hygiene, and Cultures of Planning in Asia.*[28] Brenda Yeoh´s outstanding discussion on the case of colonial Singapore showed the that the making, unmaking, and remaking of colonial built environment is an interplay and contestation of the dominant colonial forces and the underside colonized groups.[29]

I locate my study in relation to these central works as I argue that, albeit late, these concepts trickled down to colonial Manila when ideas of urban health and surveillance pervaded the public works projects in the late eighteenth to the nineteenth century. My study attempts to interrogate how these legal mechanisms directly affected the urban lives of Manila´s inhabitants.

Manila and the colony´s transformations

The study of Spanish public works in Manila and their correlation to the colonial agenda of sanitation, order, and social control is arguably an understudied theme both in Philippine history and the Spanish imperial history. In the Philippines, this topic of inquiry typically falls under the broad field of Philippine urban history. However, even this branch of historical study remains to be fully explored as Philippine historiography is still ¨remarkably deficient of comprehensive urban historical analysis. ¨[30]

[28] Robert Peckham and David Pomfret, *Imperial Contagions: Medicine, Hygiene, and Cultures of Planning in Asia* (Hong Kong: Hong Kong University Press, 2013).
[29] Brenda Yeoh, *Contesting Space in Colonial Singapore: Power Relations and the Urban Built Environment* (Singapore: National University of Singapore Press, 2003).
[30] Ian Morley, ¨Philippine Cities, Their History, Development, Culture, and Governance Review Essay,¨ *Journal of Urban History*, vol.45, no.5 (2019), pp. 1050-1056.

Many of the popularly known researches that dealt with Philippine or Manila´s urban history focus on the large-scale urban transformations during the American rule. For example, a recent publication on Manila´s urban design reflects how the 1905 Manila urban planning was designed to portray the advanced American administration compared to the backward Spanish regime; ¨henceforth, the establishment of new colonized subjects, that is, a population whose nature differed from what they were before, the founding of a just and effective government, by social, economic, and cultural opportunities previously unimaginable, and by urban environments of different plan and appearance.¨ [31]

Some published works reflect a long-dominant narrative propagated by early scholarship that development in urban planning and construction of modernizing works characterized the American rule in the Philippines. The Spanish rule in the Philippines, as contrasted to the American rule, was typically pictured as a period of infrastructural backwardness and lack of scientific and technological enterprise. The remarkable book *The Colonial Iron Horse. Railroads and Regional Development in the Philippines 1875-1935* traced the advent of the railroad system in the Philippines and its effect on the regional growth of the island of Luzon. It brings to the fore a project that involved both the Spanish and the American colonial rule. The planning and construction of a railroad system in Luzon commenced in the second half of the nineteenth century during the Spanish reign and was further utilized and expanded by the Americans in the first decades of the twentieth century. However, the following statements that appeared on the first page of the book´s introduction reveal this prevailing narrative in Philippine urban history.

> *The Manila-Dagupan railroad* ***was the single most important infrastructure built in the Philippines during the Spanish colonial period*** *that was not initiated by the Church…The construction and operation of the Manila-Dagupan railroad by the Manila Railway Company* ***contrasted sharply with the dismal public works record of the Spanish colonial government****.*[32] (emphasis supplied)

[31] Ian Morley, *Cities and Nationhood: American Imperialism and Urban Design in the Philippines, 1898-1916* (Honolulu: University of Hawai´i Press, 2018), p. 24.
[32] Arthur G. Corpuz, *The Colonial Iron Horse. Railroads and Regional Development in the Philippines 1875-1935* (Quezon City: University of the Philippines Press, 1999), p. 1. See also. Glynn, V.J., Railroad Policy and Administration in the Philippines in the American Period 1898-1924, Master of Arts Thesis, University of the Philippines, 1987.

Given this context, a revisiting of the existing body of knowledge on Manila´s earlier phase of urban transformation and the economic, political, and social metamorphosis that went through it is indispensable. The early works in the 1970s of Robert Reed[33] and Lourdes Díaz Trechuelo[34] established that the principal cities in the Philippines developed as a phenomenon of the Hispanic colonial order[35]. With the commemoration of the Philippine´s centennial and the vital task of reimagining the Philippine-Spanish relations, several government-sponsored works were also published on Manila from the viewpoint of the history of engineering and military history. Some these works include *Manila 1571-1898 Occidente en Oriente*[36] and *Ingeniería Española en el Ultramar* (siglos XVI-XIX)[37]. Since these works were published by the Ministerio de Fomento and Ministerio de Obras Publicas y Transportes respectively, the central approach of these works was to highlight the character and evolution of Spanish engineering and how it manifested in the colonies. The technical side of the infrastructure could be seen in the work of Isabel Piqueras on roads and highways.[38] Researchers who wish to focus on the history of science and engineering per sé will find this work very useful.

These works document that the beginning of Manila´s story as a Spanish colonial city began in 1571 when it became the seat of the its colonial government in the Philippines. The once precolonial bay settlement which had international trading links with the Malay peninsula, Borneo, China, Siam, Japan, and other parts of Asia was reconfigured according to the Spanish imperial vision in the Philippines. When the Spaniards established their colonial capital in Manila, its physical design and organization clearly resembled the distinction between the colonizer and the colonized. Intramuros-

[33] Robert Reed, *Colonial Manila: The Context of Hispanic Urbanism and Process of Morphogenesis* (Berkeley: University of California Press, 1978).
[34] Lourdes Díaz-Trechuelo, *Arquitectura Española en Filipinas* (Sevilla: Escuela de Estudios Hispano-Americanos de Sevilla, 1959).
[35] Daniel Doeppers, ¨The Development of Philippine Cities Before 1900,¨ *The Journal of Asian Studies,* vol. 31, no. 4 (August 1972), p. 769.
[36] *Manila 1571-1898: Occidente en Oriente* (CEDEX, Centro de Estudios y Experimentación de Obras Públicas; CEHOPU, Centro de Estudios Historicos de Obras Públicas y Urbanismo, 1998). Included in this book are: Javier Galván Guijo, ¨Apuntes de Arquitectura Colonial Española en Filipinas¨; Concepción Aguilera Fernandez, ¨Filipinas en el Siglo XIX. El Final de la Colonia¨; Dolores Romero Muñoz, ¨Puerto, Ríos, Canales: La ingeniera española¨; Amaya Sáenz Sanz, ¨Los ingenieros y las comunicaciones en Filipinas en la segunda mitad del siglo XIX¨.
[37] Ignacio González Táscon, *Ingeniería española en ultramar: siglos XVI-XIX* (Madrid: CEHOPU, 1992).
[38] Maria Isabel Piqueras Villaldea, *Las comunicaciones en Filipinas durante el siglo XIX: caminos, carreteras, y puentes* (Madrid: Archiviana, S.L., 2002).

the colonial city, was a city protected by walls not only to serve as defense from foreign invasions but also to fix a clear boundary between the Spanish colonizers and the native *indio* inhabitants and Chinese immigrants.

Over the centuries, Manila rose as a primate city with the fluorescence of the city´s commercial growth through the galleon trade. This trade, according to many noted scholars, was pivotal in the transformation of Manila from a homogeneous to a multiracial city and into a colonial capital with a distinct urban morphology.[39] By the seventeenth century, it was undeniable that Manila has already established a cosmopolitan character.

The second half of the eighteenth century, however, was a period of significant changes for the Spanish Pacific colony- the British occupation in 1762 to 1764, the start of the waning years of the galleon trade which practically controlled the colony´s economy since the late sixteenth century, and the introduction of new political, socio-economic policies in the archipelago. These changes were unfolding while Manila was experiencing a quickening pace of urbanization in the late eighteenth century, which accelerated continuously to the nineteenth century.

A clear grasp of the significant socio-economic transformations in the last quarter of the eighteenth to the nineteenth century is crucial to fully comprehend the development and metamorphosis of colonial cities, particularly Manila, in the second half of Spanish rule in the Philippines. The unparalleled work of Benito Legarda[40] complemented with the publication of Alfred McCoy and Ed de Jesus[41] are essential in the understanding of this period. These works laid the important foundations to the understanding of the colony´s transformation and growth marked by the end of the British Occupation and start of the waning of the galleon trade, the implementation of the Bourbon economic and social reforms, the opening of the islands to international trade and commerce, the

[39] Robert Reed, *Hispanic Urbanism in the Philippines: A Study of the Impact of Church and State* (Manila: University of Manila, 1967).; Carlos Martínez Shaw and Marina Alfonso Mola, ¨The Philippine Islands: a vital crossroads during the first globalization period,¨ *Culture and History Digital Journal,* vol. 3, no. 1 (2014).; Marina Alfonso Mola and Carlos Martínez Shaw (eds.), *El Galeón de Manila. Catálogo* (Madrid: Aldeasa, 2000).; William Schurz, *The Manila Galleon* (California: University of California, 1992).
[40] Benito Legarda, *After the Galleons: Foreign Trade, Economic Change and Entrepreneurship in the Nineteenth-Century Philippines* (Quezon City: Ateneo de Manila University Press co-published with the University of Wisconsin- Madison Center for Southeast Asian Studies, Second reprint 2002).
[41] Alfred McCoy and Ed de Jesus, eds., *Philippine Social History: Global Trade and Local Transformations* (Quezon City: Ateneo de Manila University Press, 1982).

increasing recognition among the authorities of the necessity for change, the mounting consciousness of the colony´s inhabitants- Spanish and natives alike- on the colony´s conditions, etc. Spanish authorities, both in the colony and in the metropolis, brought up the varied reforms that should be carried out in the Philippines. These developments marked the beginning of a colonial economy based on commercial agriculture as demonstrated in the important work on the Philippine´s economic history by Onofre D. Corpuz and enriched by the specific studies by Ed de Jesus on the tobacco cultivation, John Larkin on the sugar economy, and Norman Owen on the abaca production and importation.[42] By the 1780´s, a royal grant permitted the state monopoly of planting and manufacturing tobacco. By the 1790s, the opening of Manila´s port to European and American trading ships revitalized the colony´s economy which led to the establishment of shipping agents and commercial houses in the early nineteenth century.

María Dolores Elizalde expands this vision and argues that the Philippine´s turn towards Asia also characterized these changes as the archipelago opened new routes of exchange with the rest of the ports in the region.[43] This opening gave way to the integration of the colony to the larger world, making it more interspersed with the emerging changes of the nineteenth-century order. By the nineteenth century, the vibrancy of Manila´s port continued as the Philippines became an export-based economy of agricultural products. Manila´s bustling urban fabric would be dotted with different industries such as steam-powered cordage factory and a sugar refinery. As factories and industries grew in Manila, an influx of Filipinos from different provinces became the trend. The increasing commercial viability and the growing interest of non-Spanish nationalities to the archipelago also resulted to the arrival and settling in Manila of racially-diverse populations.

Apart from the economic transformations, an analysis of the major socio-demographic changes at the time is also important in this investigation. Norman Owen

[42] Onofre D. Corpuz, *The Roots of the Filipino Nation vol. 1* (Hawaii: University of Hawaii Press, 2007).; Ed. C. de Jesus, *The Tobacco Monopoly in the Philippines: Bureaucratic Enterprise and Social Change, 1766-1880,* reprint edition (Quezon City: Ateneo de Manila University Press, 1980).; John Larkin, *Sugar and the Origins of Modern Philippine Society* (California: University of California Press, 1993).; Norman Owen, *Prosperity Without Progress: Manila Hemp and Material Life in Colonial Philippines* (London, England: University of California Press, 1984).

[43] María Dolores Elizalde, ¨El Viaje de Filipinas hacia Asia en el filo de los siglos XVIII y XIX¨ *Vegueta. Anuario de la Facultad de Geografía e Historia* 20 (2020) pp. 163-187.

shows that in the Southeast Asian region, the Philippines and Java showed unprecedented population increase at the time. On a national scale, Philippine population grew rapidly from the mid-eighteenth to the nineteenth century with a ¨nominal rate of 1 per cent between 1740-1800, rose to 1.65 per cent between 1800-1876, before falling to 0.9 per cent in the series of mortality crises that characterized the quarter-century before the census of 1903¨.[44] As the colonial capital and principal port city of the islands, Manila´s population data best exhibited this upward population trend documenting almost 254,702 inhabitants in the 1859 census of the Philippines.[45] By the end of the nineteenth century, Manila which was comprised of Intramuros and the suburbs recorded a population of around 300,000 inhabitants. The population growth of Manila was best situated by Elizalde citing that the city actually ranked third among the Spanish cities in terms of population, following the metropolitan cities of Madrid and Barcelona. Its population was bigger than the colonial city of La Habana and the major Spanish cities of Valencia, Sevilla, and Malaga.[46]

In the past decades until the very recent years, a growing body of works analyzed Manila´s urban metamorphosis from interdisciplinary, alternative, and varied perspectives. Two important scholars need to be highlighted in this field. Xavier Huetz de Lemps numerous pioneering studies on Manila urban construction and configuration[47], the geographic-environmental conditions of its nineteenth-century water[48], the

[44] Norman Owen. ¨The Paradox of Nineteenth-century Population Growth in Southeast Asia: Evidence from Java and the Philippines¨, *Journal of Southeast Asian Studies,* vol. 18, no. 1 (March 1987) pp. 46-47. Also see: Daniel F. Doeppers and Peter Xenos, *Population and History: The Demographic Origins of the Modern Philippines,* (Madison: University of Wisconsin, Center for Southeast Asian Studies, 1998).

[45] Archivo Histórico Nacional (AHN), Censo tributario y civil de Filipinas de 1859, Ultramar, 5174, Exp. 15. The city´s composition are as follows: 10, 620 residents in Intramuros; 215, 660 in arrabals and towns; and 4,159 people residing in the river and the bay.

[46] María Dolores Elizalde, ¨Manila: Vida Cotidiana en Una Ciudad Colonial. Un Retrato a través de los viajeros del Siglo XIX,¨ *Anales del Museo Nacional de Antropología,* no. XIII (2007) p. 64. Of the 300,000 inhabitants, the Spaniards were only about 2,000 persons. The native *indios* and mestizos were around 250,000; the Chinese were around 40,000; and a few hundred Westerners and foreigners.

[47] Xavier Huetz de Lemps, ¨Materiales Ligeros versus Materiales Fuertes: The Conflict Between Nipa Huts and Stone Buildings in 19th Century Manila,¨ in Elmer A. Ordonez (ed.), *The Philippine Revolution and Beyond,* vol. 1 (Manila: Philippine Centennial Commission and the National Commission for Culture and the Arts, 1998), pp. 160-172; ¨Territorio y urbanismo en las Islas Filipinas en el entorno de 1898,¨ *Ciudad y Territorio - Estudios Territoriales*¨, número especial Territorio y Ciudades Coloniales Españolas de Ultramar, vol. XXX, n°116, (1998), pp. 381-428.; ¨Nommer la ville : les usages et les enjeux du toponyme "Manila" au XIXe siècle,¨ *Genèses*, n°33, (1998), pp. 28-48; ¨L'aménagement du quartier de San Nicolás (Manille) au XIXe siècle,¨ in María Dolores Elizalde, Josep María Fradera and Luis Alonso (eds.), *Imperios y Naciones en el Pacífico* (Madrid, CSIC, Biblioteca de Historia, 2001), vol. II, pp. 279-292.

[48] Xavier Huetz de Lemps, ¨Waters in Nineteenth Century Manila,¨ *Philippine Studies*, vol. 49, n°4 (2001), pp. 488-517.

contentions of cemetery construction in its political and religious life[49], and the cholera epidemics[50] utilize interdisciplinary knowledge and methods in synthesizing Manila´s urban evolution through the frameworks of historical geography, environmental history, history of diseases, social history, and history of communities. Of his many contributions to this field of Philippine history, some of these served as inspiration to this dissertation. On the other hand, Maria Luisa Camagay´s works connect the city´s urban history to social history, women´s history, and the history of work.[51] Going beyond the macro and large urban historical processes, Camagay highlighted the lived experiences of the obscured and marginalized sectors, the women in this case, in understanding the intersections of urbanization, industrialization, and modernization with the ordinary lives of Manila´s inhabitants.

In the recent years, a gathering of Spanish, Filipino, European, and American scholars have brought to light a wider breadth of historical themes, opened previously unexplored historical sources, and provided new tools and approaches in the study of the Philippine´s transformations, including Manila´s urbanization and growth, in the late eighteenth to the nineteenth century. Francis Gealogo, provided a new approach in understanding the city´s population through the lens of historical demography.[52] Lorelei De Viana narrates the three centuries development of one of the most important Manila suburbs through architecture and structure design[53] and together with co-architect Gerard Lico, they trace and compile the urban planning laws from the Spanish to contemporary period. [54]

Recently, young Filipino scholars´ works enrich this field of study. Using historical geography Marco Lagman and Ma. Simeona Martínez examined the spatial

[49] Xavier Huetz de Lemps, ¨La Controversia de las Sepulturas en Filipinas¨ in Xavier Huetz de Lemps, Gonzalo Álvarez Chillida, María Dolores Elizalde (ed.) *Gobernar Colonias, Administrar Almas. Poder Colonial y Ordenes Religosas en los Imperios Ibéricos* (1808-1930), Madrid: Casa de Velázquez, 2018.
[50] Xavier Huetz de Lemps, ¨Les Philippines face au fantôme du Gange: le choléra dans la seconde moitié du XIXe siècle¨, *Annales de Démographie Historique*, 1990, pp. 309-335.
[51] María Luisa T. Camagay, *Kasaysayang Panlipunan ng Maynila, 1765-1898* (Diliman: Toyota Foundation, 1992).; *Working Women of Manila in the 19th Century* (Quezon City: University of the Philippines Press in cooperation with the University Center for Women's Studies, 1995).
[52] Francis A. Gealogo, ¨Counting People: Nineteenth-Century Population History of Four Manila Arrabales Using the *Planes de Almas¨ Philippine Studies* vol. 59, no. 3, (September 2011) p. 410 pp. 399-423
[53] Lorelei D.C. De Viana, *Three Centuries of Binondo Architecture, 1594-1898: A Socio-Historical Perspective* (Manila: University of Santo Tomas Publishing House, 2001).
[54] Gerard Lico and Lorelie D.C. De Viana, *Regulating Colonial Spaces 1565-1944* (Manila: National Commission for the Culture and the Arts, 2016).

distribution of business establishments in the suburbs of the late nineteenth-century Manila as well local migration patterns and development in Manila in the late nineteenth century documenting the influx of natives as far as Ilocos, Bicol, Samar, Leyte, and the nearby Tagalog-speaking provinces of Luzon to form part of the urban work force of the capital.[55] Through microhistory, Jely Galang reconstructed the history of the Chinese through the documentation of more than 1,000 cases of Chinese ¨dangerous classes¨[56] complementing the already established works of Richard Chu and Teresita Ang-See.[57]

Daniel Doeppers, meanwhile, examined Manila´s urban history through the multi-layered lens of food and provisioning from the second half of the nineteenth century to the second half of the next century.[58] By tracing the food supply networks that nourished the city, Doeppers offers a fresh approach in examining the Manila´s social and economic structures, population movement, and the city´s nutrition and health. Studies of Greg Bankoff on the environmental history, epidemics, and disasters such as typhoons, fires, and earthquakes are also critical in comprehending the intricacies of Manila´s colonial built environment.[59] From the perspective of photographs and images, the period´s transformations were documented in a book which was a product of an exhibit about the Philippines during the second half of the nineteenth century.[60]

In 2017, the book *Filipinas, Siglo XIX Coexistencia e Interacción entre Comunidades en el Imperio Español* led by Dolores Elizalde and Xavier Huetz de Lemps, brought together different studies that revisited and reanalyzed the profound economic

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[55] Marco Lagman and Simeona Martinez, ¨ Assessing the Characteristics of Late Nineteenth Century Manila-Based Business Establishments: A Review of the Contribucion Industrial,¨ *Journal of Asian Network for GIS-based Historical Studies,* vol.2 (Dec. 2014), pp. 66-77. ; Marco Lagman, ¨ Assessing the Demographic and Spatial Characteristics of Migrant Workers in Selected Districts of Nineteenth Century Manila Using Archival Records and Geographic Information Systems,¨ *The Third Conference: GIS-based Global History from Asian Perspectives,* vol.2 (June 2015), pp.1-11.

[56] Jely Galang, *Vagrants and Outcasts: Chinese Labouring Classes, Criminality, and the State in the Philippines 1831-1898,* Doctor of Philosophy Dissertation, Murdoch University, February 2019.

[57] Richard Chu, *Chinese and Chinese Mestizos of Manila: Family, Identity, and Culture, 1860s-1930s* (Leiden and Boston: Brill, 2010).; Teresita Ang See, *The Chinese in the Philippines: Problems and Perspectives* (California: University of California, 1990).

[58] Daniel Doeppers, *Feeding Manila in Peace and War, 1850-1945,* Madison: University of Wisconsin Press, 2016.

[59] See: Greg Bankoff, ¨A Tale of Two Cities. The Pyro-Seismic Morphology of Nineteenth-Century Manila¨ in Greg Bankoff, Uwe Lübken, Jordan Sand, eds., *Urban Conflagration and the Making of the Modern World* (Wisconsin, The University of Wisconsin Press, 2012). Susana Ramírez Martín, *El terremoto de Manila de 1863. Medidas políticas y económicas* (Madrid: Consejo Superior de Investigaciones Científicas, 2006).

[60] *El Imaginario Colonial. Fotografía en Filipinas durante el periodo español 1860-1898* (Barcelona: Acción Cultural Española, Casa Asia, 2006).

and social transformations in the Philippines during the period by going beyond the traditional political, economic, and colonizer-colonized dichotomy approach. [61] Through the standpoint of entangled and networked communities characterized by interactions, collaborations, conflicts, and tensions within a highly heterogeneous colonial society, the studies scrutinized the interconnected networks of commerce and trade[62] and interrogated questions on the plurality of communities and heterogeneity of ethnic identities[63], governability and administration[64], gender[65], and cited specific cases of tensions in colonial structures[66]. From this compendium of studies, three works were heavily used in this research for their significance in understanding the complex urban fabric of colonial Manila. Xavier Huetz de Lemps provides an excellent prosographic study of the composition of the Ayuntamiento de Manila in the nineteenth century and situates them in the complex themes of ethnicity, legal, and socio-economic contexts and developments of the time.[67] Complementing this with the works on the Cabildo/Ayuntamiento de Manila by and later Luis Merino, Inmaculada Concepcion, Ruth de Llobet, and Patricio Hidalgo Nuchera, a more nuanced comprehension of the municipal government´s structure, its players´ complementary and contending interests, and the ideological development of *criollismo* among *filipinos españoles* could be achieved.[68] On the other

[61] María Dolores Elizalde and Xavier Huetz de Lemps (eds.), *Filipinas, Siglo XIX. Coexistencia e Interacción entre Comunidades en el Imperio Español* (Madrid: Ediciones Polifemo, 2017).

[62] Carmen Yuste, ¨Las relaciones entre almaceneros novohispanos y comerciantes filipinos durante el siglo XIX,¨ pp. 45-62.; Filomeno Aguilar, ¨Capitalismo azucarero: Los caminos divergentes de las haciendas en la isla de Negros y en Calamba,¨ pp. 103-136.; Alfred McCoy, ¨Formación de élites y revolución social en las Filipinas del siglo XIX,¨ pp. 139-170 in Elizalde and Huetz de Lemps (2017).

[63] Michael Cullinane, ¨Transformándose en Filipinos: Los mestizos chinos de Cebú, 1770-1850,¨ pp.297-322.; Mikel Aizpuru, ¨´Insignifante átomo de la esfera social´: La naturalización de chinos y otros extranjeros en las Filipinas españolas,¨ pp. 327-361.; William Clarence-Smith, ¨Migrantes del sur de Asia en Filipinas a lo largo del siglo XIX,¨ pp. 365- 389 in Elizalde and Huetz de Lemps (2017).

[64] Juan Antonio Inarejos, ¨Los gobernadorcillos, intermediarios de las comunidades filipinas,¨ pp. 229-244.; Eberhard Crailsheim, ¨¿Fortalecer la cohesión interna? El peligro ¨moro¨ en las Filipinas coloniales en la segunda mitad del siglo XIX,¨ pp. 395-425.; Isaac Donoso, ¨El desarrollo del mundo meridional filipino en el siglo XIX: El difícil encaje de la población musulmana,¨ pp. 429-456 in Elizalde and Huetz de Lemps (2017).

[65] Stephanie Coo, ¨Dime cómo te viste y te dire quién eres: La ropa de mujer en Filipinas durante un periodo de dinamización social, económica y cultural, 1850-1896,¨ pp. 484-512; Jean-Noël Sánchez, ¨Mujeres de Filipinas, mujer filipina: La fábrica discursiva de figuras de género en el siglo XIX,¨ pp. 460-482 in Elizalde and Huetz de Lemps (2017).

[66] Roberto Blanco Andrés, ¨Enfrentados con La Propaganda. El clero regular frente al nacionalismo filipino y la ofensiva anticlerical,¨ pp. 517-545; Resil Mojares, ¨Filipinos y españoles en el mundo colonial de la imprenta,¨ pp. 549-569 in Elizalde and Huetz de Lemps (2017).

[67] Xavier Huetz de Lemps, ¨El Ayuntamiento y la comunidad española de Manila en el siglo XIX¨, in Elizalde and Huetz de Lemps (2017), pp. 175-226.

[68] Luis Merino, *The Cabildo Secular or Municipal Government of Manila: Social Component, Organization, Economics Vol. 1 Studies on the Municipality of Manila* (Manila: Intramuros Administration, 1980).; Inmaculada Alva Rodriguez, *Vida Municipal en Manila (siglos XVI-XVII)* (Córdoba: Servicio de Publicaciones de la Universidad de Córdoba, 1997). ; Ruth de Llobet, *Orphans of Empire: Bourbon Reforms, Constitutional Impasse, and the Rise of Filipino Creole Consciousness in an Age of Revolution*,

hand, the highly heterogeneous colonial society of Manila could be clearly imagined and reconstructed in María Dolores Elizalde´s works on the burgeoning creole- middle class communities, their enterprises and networks of linkages.[69]

After the publication of these works, a series of studies focused specifically on the re-envisioning and re-examination of the reforms and modernization of the Philippines and the consequent aspirations, triumphs, and shortcomings was spearheaded by María Dolores Elizalde and María Serena Diokno. The works examined the various attempts to modernize the colony in the multiple aspects of colonial rule starting with the reforms in bureaucratic structures and the political and economic institutions[70], science, public health and medicine[71], education[72], and public works and infrastructure development[73]. In another work, Didac Cubeiro excellently traces the transportation and communication networks improvements of the Manila port system and Luzon railway system propelled by the capitalist interest in the late nineteenth to the turn of the twentieth century.[74] The production of body of knowledge in this field of investigation was further

Doctor of Philosophy Dissertation, University of Michigan, 2011.; Patricio Hidalgo Nuchera, ¨Constitucionalismo y emergencia del criollismo en las islas Filipinas (1809-1815),¨ *AHDE,* Tomo LXXXVII (2017), pp. 89-91.

[69] María Dolores Elizalde, ¨Interacciones empresariales entre las elites urbanas filipinas: Barcos, tranvías, cervezas y aceites¨ in Elizalde and Huetz de Lemps (2017), pp. 63-100; ¨Navegando entre comunidades: El caso del ¨español-filipino¨ Pedro P. Roxas y su entorno¨ in Elizalde and Huetz de Lemps (2017), pp. 249-294.

[70] Maria Serena Diokno, ¨Fraternity, Nationhood, and Modernity in Nineteenth Century Philippines,¨ in María Dolores Elizalde and Maria Serena Diokno, *The Modernization of the Philippines in the Nineteenth Century* (Manila: National Historical Commission of the Philippines, 2020), in press.; María Dolores Elizalde, ¨The Intense Struggle Between Reformists and Anti-reformists in the Process of Modernizing the Philippines,¨ in Elizalde and Diokno (2020), in press.; Martín Rodrigo, ¨Business and Commerce in the Last Two Decades of the Nineteenth Century,¨ in Elizalde and Diokno (2020); William Clarence-Smith, ¨Industrialization in the Philippines in the Nineteenth Century,¨ in Elizalde and Diokno (2020), in press.

[71] Francis Gealogo, ¨Crisis Mortality, Epidemic Outbreaks, and the Pre-Transition Demographic Challenges to Modernity in the Nineteenth Century Philippines,¨ in Elizalde and Diokno (2020), in press. Francisco Javier Martínez, ¨Origins of Bacteriology in the Philippines. The Municipal Laboratory of Manila,¨ in Elizalde and Diokno (2020), in press.

[72] Juan Antonio Inarejos, ¨The Modernization of Education in the Philippines,¨ in Elizalde and Diokno (2020), in press.; María Teresa Trinidad Tinio, ¨Public Education and the Lingua Franca in the Nineteenth Century Philippines,¨ in Elizalde and Diokno (2020), in press.; Filomeno V. Aguilar, ¨The Escuela Náutica of Manila¨ in Elizalde and Diokno (2020), in press.

[73] Ros Costelo, ¨´Constructing the Colony´: Colonial Civil Engineers and the Inspección General,¨ in Elizalde and Diokno (2020), in press. Didac Cubeiro, ¨El Trazado de carreteras en la Isla de Luzon (1897,¨ in Elizalde, María Dolores. *Anhelos de Cambio: Reformas y Modernización en las Filipinas del Siglo XIX* (Madrid: Editorial Polifemo, 2020), in press.

[74] Didac Cubeiro, ¨Modernizing the Colony: Ports in Colonial Philippines 1880-1908,¨ *World History Connected*, vol. 14.3, Illinois University Press, Hawaii University, (November 2017).

expanded as emerging works in science[75], engineering[76], and heritage[77] were also highlighted. This study hopes to locate itself in this growing body of interdisciplinal and multidisciplinal works affirming that indeed the late eighteenth and nineteenth century was marked by modernizing and innovative reorganizations and transformations in the colony.

Lastly, understanding of the heterogeneity of Manila´s population and their conditions is also essential as shown in the different studies on the Spanish *peninsulars*, *insulars and mestizos,* native *Indios,* Chinese immigrants*,* and other European and American foreigners.[78] The stringent colonizer-colonized demarcation that once characterized the city in the early Spanish rule could no longer be said in the context of nineteenth-century Manila. The suburbs became a melting pot of the diverse racial and socio-economic groups in the capital. In this porous and mixed settlements, how did different communities respond as they shared the same unaligned, narrow, and insalubrious streets, the same putrefying estuaries and river, the same dangers from unhygienic food spaces in markets and slaughterhouses, the same noxious airs emitted from cemeteries and pollutants, and the same threats in times of epidemics?

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[75] María Dolores Elizalde, ¨Hacer Ciencia en las colonias: El Observatorio de Manila y los cuerpos profesionales del Estado liberal en un tiempo de reformas y modernización en Filipinas,¨; José Antonio Rodríguez, ¨Cartografía española en Filipinas en el fin de siglo,¨**;** Helge Wendt, ¨El conocimiento sobre el carbón y su mimería en Filipinas (1840-1860),¨; Kerby Alvarez, ¨The June 1863 and the July 1880 earthquakes in Luzon, Philippines: Interpretations and Responses,¨ in *Dossier ¨Ciencia e Ingeniería en Filipinas a Fines del Siglo XIX¨ Illes i Imperis,* 22, (2020), in press.; Aitor Anduaga, ¨Ciencia en el archipiélago filipino,¨; Francisco Javier Martínez, ¨El Laboratorio Municipal de Manila,¨ in María Dolores Elizalde, *Anhelos de Cambio: Reformas y Modernización en las Filipinas del Siglo XIX* (Madrid: Editorial Polifemo, 2020), in press.

[76] Darina Martykanova, ¨Reconstruir el dominio y generar riqueza: los ingenieros en las colonias españolas durante el siglo XIX,¨; Isabel Rábano*,* ¨Encuentros y desencuentros con la metrópoli: la Inspección General de Minas de Filipinas y sus ingenieros,¨ in *Dossier ¨Ciencia e Ingeniería en Filipinas a Fines del Siglo XIX¨ Illes i Imperis,* 22, (2020), in press.

[77] Joaquín Ibánez, et. al., ¨Industria y obra pública como motores de la modernización en Filipinas en el último tercio del siglo XIX,¨; José María Fernández Palacios "Ver en las islas uno de los mayores adelantos del siglo": La política española de infraestructuras telegráficas en Filipinas, 1863-1898,¨ in María Dolores Elizalde, *Anhelos de Cambio: Reformas y Modernización en las Filipinas del Siglo XIX* (Madrid: Editorial Polifemo, 2020), in press.

[78] See: Xavier Huetz de Lemps, ¨Los Criollos en las Filipinas del Siglo XIX,¨; María Dolores Elizalde, ¨Movilidad, Mestizaje y Significación de los Criollos en las Filipinas del Siglo XIX,¨ in María Dolores Elizalde and Carmen Yuste, *Redes Imperiales*. *Intercambios, Interacciones, y Representación Política entre Nueva España, las Antillas, y Filipinas, Siglo XVIII y XIX* (Madrid: Consejo Superior de Investigaciones Científicas, Estudios Americanos, 2018).; Miguel Luque Talaván and Marta María Manchado López (coord.), *Un mar de islas, un mar de gentes. Población y diversidad en las islas Filipinas* (Córdoba: Universidad de Córdoba, Servicio de Publicaciones, 2014).; Otto Van Den Muijzenberg, *The Philippines Through European Lenses: Late 19th Century Photographs from the Meerkamp van Embden Collection* (Quezon City: Ateneo University Press, 2008).

Other works that are beyond the period of study in this dissertation are worth mentioning to provide perspective on the continuities and discontinuities of historical processes and actors after the Spanish rule. Florentino Rodao´s works on the Spanish communities that remained in the archipelago is an excellent entry point for further studies.[79] Although his period of specialization focuses on the twentieth century, Michael Pante´s incisive works examine the politics behind Manila´s urban planning during the Marcosian regime. Because of Manila´s density problem, the American´s perception turned to the city´s peripheral areas, Santa Mesa and San Juan, as the ideal livable spaces.[80]

Approach and Methodology

In the mid-1970s, an important and essential trend characterized Philippine historiography. Filipino and foreign scholars recognized the need to decenter Philippine history and turn its focus to local and regional experiences.[81] Decentering the Philippine narrative meant veering away from a Manila-centric lens of history. As a result, scholars began to explore the understudied Philippine towns, provinces, regions and their political and socio-economic development in the precolonial and colonial period or the inception and growth of nationalist and revolutionary movements in these localities, etc. For Filipino scholars, this development in Philippine historiography enrichens and widens a true national history which is representative of the rich and diverse geographical experience of the archipelago. Half a century has passed, and yet this aspiration remains true until this day.

This research, however, goes back again to the center- Manila. This ¨going back to the center¨ is not meant to perpetuate a dominant Manila-centric history but an attempt to respond to some of the gaps in the existing body of literature on Manila´s colonial urban history. First, Manila´s story as a Spanish colonial city and capital is a paradox. It was both a center and a periphery at the same time. For three centuries, it served as the

[79] Florentino Rodao García, ¨Las compañías españolas después de la Revolución Filipina¨ in Miguel Luque Talaván, Juan José Pacheco Onrubia, and Fernando Palanco (coord.), *1898, España y el Pacífico* (1999), pp. 557-566.; ¨La Comunidad Española en Filipinas, 1935-1939. El impacto de la Guerra Civil Española y de los comienzos de los preparativos de la independencia de Filipinas en su evolución e identidad,¨ Doctor of Philosophy Dissertation, University of Tokyo, 2007.
[80] Michael Pante, ¨Peripheral Pockets of Paradise. Perceptions of Health and Geography in Early Twenteith-Century Manila and its Environs,¨ *Philippine Studies*, 59, no. 2 (2011), pp. 187-212.
[81] David Joel Steinberg (ed.), *In Search of Southeast Asia. A Modern History Revised Edition* (Hawaii: University of Hawaii Press, 1987), p. 520.; McCoy and De Jesus, eds. (1982).

Spanish crown´s nucleus of power in its most far-flung Pacific colony. How colonial ideals and schemes on urban processes were applied, exercised, accepted, challenged, or bent is a question that needs to be continuously revisited. Second, the existing body of knowledge on urban Manila is still limited to specific historical periods, particularly to the early contact years of Spanish rule, the American period, and the post-War years. This research serves as a bridge to these disjointed periods because the ¨transformations in the Philippines between the late eighteenth and mid-twentieth centuries, [were] the origins of the Philippine´s development problems in the second half of the twentieth century¨.[82] Eventually, this contribution could be used in the broader project of investigating the shared but, at the same time, distinct evolution of other colonial cities in the Philippines.

No single approach or methodology was employed in this dissertation as the study of Manila´s historical urban transformations could be best viewed and scrutinized from different pathways and angles and from the entangled lens of urbanization and urbanism, science and engineering, medicine and public health, disease and environment, modernity, governability, and control in the context of colonialism and imperialism. However, the following conceptual tools and historical discourses were essential in the elaboration and unfolding of this research.

First, the intersection of colonial public works and the imperial project of sanitation, order, and control can be analyzed in the broad discourse of colonial modernization and/or colonial modernity. Modernization as an analytical tool, has been widely used to understand the transformations that have occurred in the non-Western world, mostly under the system of European colonial rule.[83] It was through colonial rule, therefore, that many countries were exposed and transformed by the West´s institutions and techniques. The works of Anthony King, Michael Adas, and David Arnold direct this current research in analyzing how the exportation of urbanization, science, medicine, and technology from the Western to the non-Western world, was used to justify the hegemony of the colonizer over the colonized as what happens in the modernization process.[84] Indeed, the project of urbanization and modernization was part of the colonial

[82] María Dolores Elizalde and Xavier Huetz de Lemps, *Filipinas, Siglo XIX. Coexistencia e Interacción entre Comunidades en el Imperio Español* (Madrid: Ediciones Polifemo, 2017), p. 11.
[83] Robert L. Tignor, *Modernization and British Colonial Rule in Egypt 1882-1914* (Princeton, NJ: Princeton University Press, 2004), pp. 3-4.
[84] Anthony King, *Urbanism, Colonialism, and the World-Economy Cultural and Spatial Foundations of the World Urban System* (London and New York: Routledge, 1990). Michael Adas, *Machines as the Measure of Men. Science, Technology, and Ideologies of Western Domination* (Ithaca and London: Cornell University Press, 1989). David Arnold, *The New Cambridge History of India III. Science, Technology and Medicine in Colonial India* (Cambridge: Cambridge University Press, 2004).

government's agenda to strengthen its control over the colony. Through the use of science and technology (e.g. in public works, sanitation and health, security and order) the colonial government projected itself as the bearer of the civilization and modernization. Superior technology was one of the characteristics that differentiated the colonizer from the colonized. In the late eighteenth and nineteenth century, these ideas were tested and negotiated in the context of an era marked by heightened cross-cultural intersections, convergences, and linkages as shown in the investigations by Bayly and Osterhammel.[85]

Through ideas, practices, and institutions, modernity or ¨the condition of being modern¨ was something to be achieved. Marian Aguiar contends that culturally, modernity gave rise to new symbols.[86] In her brilliant book, she used the ¨train symbolism¨ of the railway system to encapsulate the modernity project of the British empire in colonial India. In this study, I propose that the public works projects were ¨structural symbols of empire¨. The Manila street projects, waterworks system, slaughterhouses, and cemeteries evoke ideas and visions of the empire, affirming the idea that the ¨symbolism¨ of these structures is ¨not arbitrary, as cities and their built forms have long been useful to the display of political power¨.[87]

Related to this is the concept of ¨hygienic modernity¨ proposed by Ruth Roganski in her study on the late nineteenth and twentieth-century colonial Tianjin, China. The project of introducing hygienic modernity involved the (re)configuration of urban spaces and the creation of infrastructures that were never devoid of ideology. In the port city of Tianjin, sanitation infrastructures erected by the British, Germans, and Japanese were never neutral as a constructed ¨building was not simply an edifice, but a symbol of something beyond itself¨. For instance, the planning and design of roads answered the British ¨concerns of sanitation, hygiene, and visual arrangement¨.[88] In the port city of Manila, the public works projects were structural and spatial symbols that conveyed the Spanish project of enlightened urbanism and nineteenth-century modernity.

Patrick Joyce in his study on modernity and rational governmentality posits that in the creation and elaboration of cities, spaces such as the street, the market, the cemetery, the sewers and the water pipes were spaces where the manifold connections

[85] Bayly (2005).; Osterhammel (2004).
[86] Marian Aguiar. *Tracking Modernity: India´s Railway and the Culture of Mobility.* Minneapolis, London: University of Minnesota Press, 2010, p. 1
[87] Morley (2018), p. 12.
[88] Ruth Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (California: University of California Press, 2004), pp. 195-202.

between governmentality and everyday conduct could be explored and tested.[89] He remarked that urban regulations were ¨contingent, local, and contextual¨. In colonial contexts, the European concepts of rationality and modernity were heavily contested in the local circumstances. For instance, the imposition of the *Western* idea of linear streets in India was ¨next to impossible¨ as the local´s indigenous notions of streets were ¨unenclosed spaces made up of many functions such as for working, living, and socialising¨.[90]

Second, this research interrogates the colony´s modernization process and urban metamorphosis through the lens of entangled, global, and transnational histories. Dolores Elizalde and Xavier Huetz de Lemps present the idea of ¨entangled communities¨ (*enredo de comunidades*) wherein interactions, coexistence, contestations, and negotiations formed part in the complex formation of colonial societies. In this study, the modernizing infrastructures and the spaces that they created were results of the interplay and exchange of the different colonial forces and heterogeneous groups with their own interests, limitations, practices, and viewpoints. As public works projects mostly replicated the State´s ideals and agenda, this approach integrates into the narrative the varied responses of the colonial subjects and the undersides in history.

The understanding of the conception and materialization of the infrastructure works in the late eighteenth to the nineteenth century would be incomplete if not located and understood within the realm of global studies and transnational histories. As Elizalde points out, the Philippines during this time entered a new phase with its integration to the broader world beyond the traditional Transpacific connection that was ushered in by the Manila-Acapulco trade. Her study demonstrates the importance of analyzing the developments during this period through the expanding networks of linkages of the archipelago with the rest of Asia[91]- a perspective that offers a fresh methodology in establishing the associations and connections of emerging ideas and technological know-how that brought the public works projects to light. In the case of Manila´s built environment, the nineteenth century signalled the hybridity of scientific knowledge and techniques which was a result of the growing interaction not only of Spain and the

[89] John Law, *Organizing Modernity, Social Ordering, and Social Theory,* Great Britain: T.J. Press, 1946, p. 17.
[90] Ibid., p. 225.
[91] María Dolores Elizalde, *Vegueta. Anuario de la Facultad de Geografía e Historia* 20 (2020), pp. 163-187.

Philippines but of colony´s administrators, engineers, techno-scientific, medical, and sanitary experts with the neighboring French and British-controlled territories in Asia.

Lastly, a nuanced and multi-perspective approach of urban history is imperative. In the late 1960s and early 1970s, scholars examining the city´s experience and transformation pushed for an interdisciplinary approach in the study of urban history. Called the *new urban history,* this methodology recognized that ¨urban problems are perhaps the most frequently cited illustration of the more general necessity of interdisciplinary studies¨.[92] Utilizing different perspectives and fields of inquiry, these studies attempt to view and analyse the city both as *site* and *process.* This investigation on Manila´s urban experience in the late eighteenth to the nineteenth century hopes to interweave urban history, history of science and medicine, environmental history, social history, and history of ideas through the maximum use of different archival materials from maps and plans to reports and memoirs.

Sources

Taking into consideration the gaps and limitations of previous works, I attempt to maximize the use of primary sources in this investigation. Archival documents, maps, plans, photos, memoirs, manuscripts and newspaper articles constitute primarily the sources used in this research. Three archival institutions served as pillars that provided the foundation and body of this research- the Archivo General de Indias (AGI) and the Archivo Histórico Nacional (AHN) in Spain, and the National Archives of the Philippines (NAP). The excellent published guides to these archives are indispensable for scholars who wish to investigate the Philippines during the Spanish rule.[93]

I am one of the few lucky Filipino researchers that was given the rare opportunity and privilege to explore and utilize the different archives in Spain. For the longest time, our knowledge of the Spanish rule in the Philippines had been limited and constrained

[92] Theodore Hershberg, ¨The New Urban History,¨ *Journal of Urban History,* vol. 5, no. 1 (November 1978), p. 30.
[93] Francisco Hidalgo Nuchera, *Guía de Fuentes Manuscritas para la Historia de Filipinas Conservadas en España* con una guía de instrumentos bibliográficos y de investigación (Madrid: Fundación Mapfre, 1998). For sources on the Spanish colonial governance in the Philippines outside of Spain: *Guía de Fuentes Manuscritas para la Historia de Filipinas Conservadas Fuera de España* (Madrid: Fundación Mapfre, 2003).; Francisco Hidalgo Nuchera and Xavier Huetz de Lemps, ¨Fuentes manuscritas para la historia de las Filipinas hispanas conservadas en Francia,¨ *Moussons* 5 (2002): 101-112.

due to our lack of access and unfamiliarity to Spanish primary and secondary sources. This could be attributed to several factors such as language barrier, poor paleography and archival skills, economic constraints to undertake months-long (or even years-long!) research abroad, and mere unawareness of the existence of these archival sanctuaries and published researches. A quick discussion on the organization and structure of the Spanish archives perhaps would be beneficial to other Filipino researchers and graduate students. The Spanish archives that are relevant to Philippine colonial history may be broadly categorized into two: the state archives and the religious archives.

The online portal of the state archives (Portal de Archivos Españoles) is the entry point of all researchers who wish to access the different archives managed by the State. It is imperative to familiarize first with the online portal before actual research in the archives is to be undertaken. The portal provides valuable information related to the different collections in the various state archives (e.g. Archivo de Simancas, Archivo Histórico Nacional, Archivo General de Indias, etc.). In this portal, researchers get a brief overview of the description of the records and the organizational structure of the Spanish administration in the different epochs. For researchers interested in the Philippines during the Spanish rule, the two key archives pertinent to the study are the Archivo General de Indias (AGI) and the Archivo Histórico Nacional (AHN). Archival documents that deal with the Spanish colonial administration in the Philippines and other territories in the sixteenth to the early nineteenth centuries can be consulted in AGI in Seville, Spain. Meanwhile, those that refer to the nineteenth-century governance of the last colonies of Spain which consisted of the Philippines, Cuba, Puerto Rico, and Santo Domingo[94] are kept and open for public consultation in AHN in Madrid, Spain.

The AGI is the convergence place of all early modern Iberian empire historians and researchers. The Philippines, which was under the Spanish empire for three centuries, constituted this realm. The configuration of the AGI reflects the Spanish empire´s early modern organization and imperial reach. Colonies and territories were divided into sections of ¨Audiencia¨[95]. In the case of the Philippines, all documents that pertain to the archipelago´s administration belonged to the sub-section ¨Audiencia de Filipinas¨. This

[94] Compared to the first three Spanish territories, Santo Domingo documents only cover the first half of the nineteenth centuty.

[95] The ¨Gobierno¨ section of the AGI is comprised of the documents *Audiencia de Buenos Aires, Audiencia de Caracas, Audiencia de Charcas, Audiencia de Chile, Audiencia de Cuzco, Audiencia de Filipinas, Audiencia de Guadalajara, Audiencia de Guatemala, Audiencia de Lima, Audiencia de México, Audiencia de Panamá, Audiencia de Quito, Audiencia de Santa Fe, Audiencia de Santo Domingo,* and diverse documents under the subsection *Indiferente General.*

sub-section which comprises of almost 1,077 bundles contains letters, petitions, reports, and various documents by the governors-general, civil and secular officials, religious orders, city administrators of Manila and the rest of the islands of the Pacific colony. It also contains abundant documents pertaining to the galleon trade.

Consulting the earlier sources housed in the AGI is crucial to trace the beginnings of *enlightened urbanism* in the Philippines. However, locating sources that tackle Manila´s urbanism and public works project in the late eighteenth to the early nineteenth century was a difficult task. While most of the early documents (16th and 17th centuries) are already well-catalogued, described, and even digitized, AGI documents pertaining to the 18th century are still left mostly unexamined and unexplained. Oftentimes, the bundles only contain a one-sentence description. To put clear direction to the research process, I consulted first the digitized documents in the ¨Estado¨ section. These documents provide a bird´s eye view of the administration of each governor-general in the Philippines. The reports are brief and are seldom detailed, but this gave the first direction to the research. Afterwards, I proceeded to the examination of the documents in ¨Audiencia de Filipinas¨. In order to ensure that all bases were covered in the best way possible, all bundles (*legajos*) that encompass the last decades of the century were patiently opened and scrutinized piece by piece. Then, I proceeded to the ¨Ultramar¨ section of the AGI to cover the early decades of the nineteenth century. This section is still in the process of producing detailed and comprehensive descriptions of documents that comprise the bundles, so each page had to be read and investigated patiently and thoroughly. Essentially, almost all the primary sources tackling the last decades of the eighteenth to the early nineteenth century were obtained from the AGI.

Meanwhile, the AHN houses thousands of documents, plans, and maps that deal with the public works projects and the policies and processes of urban planning and configuration in the Philippines in the nineteenth century. These documents are under the section ¨Ministerio de Ultramar¨. Under this section, the subsections of Gobierno de Filipinas, Fomento de Filipinas, and Gracia y Justicia de Filipinas contain valuable and rich information about the political, economic, religious, and social aspects of the Spanish rule in the archipelago. For my study, the first two subsections provided exceptional and useful data. The first subsection (*Gobierno de Filipinas*) consists of around 6,461 documents (*expedientes*) that dealt with Spanish governance and administration in the islands. In this research, I utilized this subsection for documents concerning the general Spanish policies as well as documents on the construction and reform of slaughterhouses,

public markets, and public lighting.[96] The second subsection *Fomento de Filipinas* can be translated as ¨development of the Philippines.¨ This comprised documents pertaining to agriculture (*Agricultura*), health and welfare services (*Beneficiencia y Sanidad*), general development (*Fomento General*), public instruction (*Instrucción Pública*), and public works (*Obras Públicas.*)

The *Obras Públicas* documents provided the bulk of data that gave way to the possible reconstruction and analysis of the public works projects that were carried out in the Philippines in the nineteenth century. The documents´ classification include *Aguas*, *Carreteras*, *Construcciones Civiles, Ferrocarriles, Puertos y Faros, Telégrafos*, *Asuntos Generales de Obras Públicas* and *Personal de Obras Públicas.* The first six groups deal with different public works projects while the last two groups pertain to the management and personnel of these undertakings. These documents comprise the different projects in the different islands and provinces from the planning stage, to the implementation and execution, and at times even their non-completion.

The documents in the Seville and Madrid archives undoubtedly maintain a well-preserved compilation of thousands and thousands of documents that most Filipino researchers are still unaware of. These well-preserved documents make the researcher imagine on the complex colonial bureaucracy behind the empire-colony organization through the paper trail of almost all matters that pertained to the colony. For instance, petitions from the local communities in Manila, elevated to the Ayuntamiento and the central government in the islands, then submitted to the different administrative corps in Madrid. These documents provide a glimpse of the perspective the metropolis on the administration of its farthest colony as well as the decision-making processes involved in its governance. As a researcher, I saw in these sources a very complex colonial administration with diverse institutions as well as complementing and conflicting ideas and interests.

The documents found at the National Archives of the Philippines (NAP) form an essential base of this research. While still considered official sources produced by the colonial government in the Philippines, if analyzed creatively, these documents could fill the oftentimes lacunae of highlighting the presence and voice of the natives and other non-European inhabitants in the city. Reading against the grain is always essential in this

[96] It is still a surprise for me why these infrastructures were not included in the subsection *Fomento de Filipinas.*

undertaking to be able to represent these actors not only as passive receivers of colonial policies but also as active participants in the unfolding of historical and social processes.

In the first phase of this research, I was able to survey and consult original documents in the NAP archives in Paco, Manila. When changes were made in the research policies in the NAP, I continued my consultation utilizing the microfilmed copies of the NAP collection accessible at the Biblioteca Tomás Navarro Tomás of the Centro de Ciencias Humanas y Sociales, Consejo Superior de Investigaciones Cientificas (NAP-BTNT-CCHS-CSIC) in Madrid. The Spanish Documents Section (SDS) of the NAP is composed of around 432 categories that range from the wide aspects of political, economic, social, judicial, and military colonial administration. Unlike the AGI and AHN, the organization of the NAP documents does not readily facilitate an understanding of the overarching colonial ideology or framework behind the production of these records. There was no single subsection that comprised all the public works projects that were undertaken in the colony. For this reason, the documents that were consulted in the NAP collection in this research were wide-ranging which include the following: *abastecimiento de aguas; alcantarillas; alumbrados públicos; animales sueltos; ayuntamiento de Manila; bandos y circulares; beneficencia y sanidad; carreras de caballos; carruajes, carros y caballos; cementerios, Corregimiento de Manila, Cuerpo de Vigilancia, mataderos, matanza y limpieza de reses, mercados públicos, obras públicas, personal de ingenieros y arquitectos municipales, policía urbana, sanidad, teatro y música,* etc. For consistency and uniformity, I used the Microfilm Rolls database of the NAP-BTNT-CCHS-CSIC in Madrid as the standard citation for this dissertation compared to the SDS organization of the NAP in Manila.

Both NAP collections in Manila and Madrid face severe challenges and limitations. Many of the documents are not organized chronologically. More importantly, a significant number of records are in deteriorating and indecipherable state due to termite (*anay*) infection, humidity, and poor conservation. These factors add difficulty to the already strenuous reading of microfilmed documents.

I also consulted two religious archives in Spain: the Franciscan archives (Archivo Franciscano Ibero-Oriental, AFIO) in Madrid and the Augustinian archives (Archivo de la Provincia Augustino de Filipinas, APAF) in Valladolid. Though I was not able to gather much data from these archives due to the nature of my subject matter, these two remain as essential and indispensable institutions to Philippine colonial history.

Digitized manuscripts, memoirs, and published books written by some of the Spanish hygienists and doctors, religious orders and priests, techno-scientific reformers, foreign travellers, and colonial officials were also very critical in this research. The published works of doctors and engineers considered as the urban reformers of the time are indispensable sources of information to the history of ideas at the time. Annual government reports, compilations of laws, urban norms, and regulations published in the nineteenth century were also utilized in this investigation. Most of these primary sources were accessed through the digitized collections of the Biblioteca Digital Hispánica of the Biblioteca Nacional de España (Madrid, Spain), University of Santo Tomas Heritage Collection (Manila, Philippines) and other online repositories of American and European libraries and research institutions.

The government periodical *La Gaceta* was also used in this research. Non-official periodicals released in the second half of the nineteenth century such as *Ilustración Filipina, Diariong Tagalog, Diario de Manila*, *Manila Alegre,* and *La Oceanía Española* provided rich data and, sometimes, straightforward and candid commentaries on the ground. Aside from these, the *Revista de Obras Públicas* which dedicated primary attention to the scientific and technological aspect of the public works enriched this investigation.

Chapter Structure

The thesis comprises of two parts which encompass seven chapters. The first part, which is composed of three chapters, establishes the stage, highlights the actors and institutions and provides an overview of the processes and policies that were involved in the carrying out of public works projects in Manila in the late eighteenth to the nineteenth century. The names and institutions who were behind the infrastructure works were discussed in this part of the dissertation.

The second part of the dissertation, which is composed of four chapters, presents case studies of public works projects as major examples of the modernizing ventures of the colonial government during the period. These chapters covered infrastructure works on the street and urban planning, public lighting, waterworks system and the nascent attempts of introducing a sewerage system, the establishment of provisioning networks of slaughterhouses and markets, and the creation of urban general cemeteries for the

capital. These cases were chosen due to the intended focus of this research which is sanitation and order as well as the availability of existing literature and sources. It must be noted however that apart from these cases, other innovative plans which were not included in this dissertation such as the railway system, the telegraph, port networks, etc. were also introduced and established in the archipelago during the period being investigated.

In the first chapter, historical maps and reconstructions of Manila and its suburbs´ physical spaces were used to trace and provide a more nuanced discussion of the changes in the city´s urban morphology and layout in a span of over a century. Which suburbs first demonstrated rapid growth and expansion? Was development concurrent in all parts of the city? Through this, the study also offers a clearer delineation of what comprised the late eighteenth and nineteenth-century Manila in the hope of making the city more *legible*, a task that is still understudied until this time. Part of *knowing* the city is understanding the political entity that governed and managed it. Comprehending the municipalization of the public works projects during the time equally require the understanding of the evolution of the Manila city council´s composition. Thus, a brief overview of the Ayuntamiento de Manila, its structure, and players is indispensable in this study.

Chapters 2 and 3 demonstrates that the materialization and transformation of infrastructures and their connections to the city´s problems of sanitation and order are better understood when linked to the complex historical process of urbanization and the emergence of modernizing organizations and individuals who were drivers of reforms in the fields of public works, engineering, medicine, public health, and urban planning. The second chapter tracks the conception of colonial policies and creation of institutions related to public works construction (i.e. *Cuerpo de Ingenieros, Inspección General de Obras Públicas*). Chapter 3 traces the formations of institutions concerned with the colony´s agenda of sanitation and hygiene (i.e. *Junta de Sanidad, Subdelegación de Medicina, Cirugía y Farmacia*), and preservation of colonial order and control (*milicia urbana, Cuerpo de Vigilancia, Guardia Civil Veterana*). In these chapters, the role played by military engineers, architects, doctors, and medical personnel in the late eighteenth century and early nineteenth century up to the arrival of more civil specialists in the field of engineering and medicine in the next decades are highlighted. An urban police arm was also created since the late eighteenth century to control the activities and behavior of the city residents.

The fourth chapter follows the idea of the street (*las calles públicas*) as the center of the built environment. Streets and sidewalks are the main public places of a city. In the late eighteenth century, colonial administrators pushed for the construction and improvement of streets and public spaces in Manila. Reform measures of constructing and paving the streets, plazas, and thoroughfares in the colonial capital were carried out at the time. As the city continued to grow in the nineteenth century, the challenges of public sanitation and order also intensified. City reformers reconfigured the city as new layout of streets and barrios were designed. Streets were paved, numbered and named, widened and aligned, cleaned and cleared to cement the colonizer´s idea of hygiene and ornate, security and order, and social control. This chapter also brings into the fore how the ideas of security and urbanity were integrated into the street public lighting *(alumbrado público*) projects in Manila. The advent of public lighting in the late eighteenth century came into fruition in the midst of the street reforms projects in Manila. In effect, streetlights aside from being useful guideposts and means to control disorder were also viewed as elegant street embellishments and ornaments that booster the image of progress and civilization in the colonial capital. These processes converted the street, sidewalks, and public spaces as specific spaces where colonial relations and policies were put to the test.

The fifth chapter focuses on the waterworks (*el abastecimiento de agua*) and the beginnings of a sewerage system of Manila. Supplying the city with clean drinking water had been a perennial colonial endeavor since the eighteenth century. The increasing urbanization of Manila in the next century proved the imperativeness of the project. Considered as one if not the most important sanitary infrastructure achievements of the Spanish colonial government piped water began to flow in Manila in the 1880´s. Used as a testament of modern engineering of the time, colonial administrators and techno-scientific reformers utilized this public works project not only as a solution to the problems of sanitation and hygiene but also as a tool and symbol to cleanse and modernize the colonial ¨body¨ and colonial city. Finally, the chapter interrogates how water access, exclusion, and control perpetuated existing colonial realities and/or resulted in ideological, spatial and urban reconfiguration of Manila in the last decades of the nineteenth century.

The sixth chapter tackles the slaughterhouse and public markets (*los mataderos y mercados públicos*). Like the cemetery, these public works projects reveal ideas which were characteristic of the urban Bourbon reform agenda verbalized in the late eighteenth

century and brought into physical form in the next century. The construction of the slaughterhouse away from the concentrated population yet attempting to maintain an accessible distance to public markets, the regulation of their physical and architectural design, and the policies that governed the use of these infrastructures show the colonial government´s preoccupation on poor diet and nutrition, public health, hygiene, and sanitation. These transformed the slaughterhouse and markets as landscapes of control and contestation wherein changing ideas with regard urban space and sanitation and the shifting attitudes towards food consumption came into play.

The seventh chapter deals with the construction of cemeteries (*los cementerios*) in Manila. In the late eighteenth century, the Spanish Bourbon agenda pushed for the cemetery and burial practices reform through the 1787 royal decree that ordered the construction of cemeteries away from towns, cities, and settlements. In Manila, the campaign of reforming cemetery and burial practices was a long, arduous process that involved political, religious, sanitary, and traditional interests and concerns. This chapter traces the stories of the Paco Cemetery and La Loma Cemetery in Manila which were established in the first half and second half of the nineteenth century respectively. The development of these urban death infrastructures provides a glimpse of the of the period´s changing ideas with regard mortality and public sanitation and how these notions were physically translated in the planning and creation of the Manila´s general cemeteries. Like other colonial public works projects, the cemetery was transformed into a space governed by a web of norms, policies and regulations. As a consequence, the cemetery, perhaps the most familiar monument for the dead, became a ground of contention for the living wherein colonial ideas and policies of sanitation, order, and control were constantly challenged, resisted, or negotiated.

PART I:

The Structure: Defining the Framework

The first part of the dissertation has two aims. First, it seeks to map Manila´s metamorphosis in over a century by highlighting the cartographic transformations of the city from the late eighteenth to the late nineteenth century. These select maps, mostly authored by colonial engineers, displayed the environment conditions, urban changes, and physical developments of the colonial capital. Through time, the maps of Manila became more expanded, detailed, and refined- designating specific names of districts, exhibiting networks of streets and thoroughfares, outlining architectural and structural components, pinpointing infrastructure projects, and delineating the suburbs´ boundaries. A ¨view from above¨ evoked a sense of ¨wholeness¨ of the urbanizing and burgeoning Manila and its suburbs. Utilizing the maps, we could infer how the process of documenting the colonial territory and of making the city more legible took place.

Second, it aims to trace, albeit in broad strokes, the colonial institutions and actors that were crucial in the affairs of construction and infrastructures, sanitation and hygiene, as well as order and colonial control. For instance, this part intends to provide a general overview of the composition of the *Ayuntamiento de Manila,* the political entity that governed the city and to which the public works projects corresponded.

The carrying out of more public works projects in Manila designed to address the problems of public health and order became possible due to the global and imperial changes which led to ideological, legal, and institutional reforms. Indeed, this is grounded on what Bayly argues that the birth of the modern world was characterized by the birth of ¨specialized institutions¨ and the emergence of ¨forces such as the ideological constructions and the mechanisms of the state.[1] It is in this context that we examine the specialized techno-medico-scientific groups that were important drivers in the carrying out of public works projects. Here, we seek to get to understand the engineers, architects, sanitary professionals, doctors, and urban planners who brought in new ideas and technologies to design infrastructures and urban policies in order to address the urban problems of public health, hygiene, order, and control in the colony.

[1] C.A. Bayly, *The Birth of the Modern World 1780-1914,* (*Global Connections and Comparisons*, Cambridge: Cambridge University Press, 2004), p. 7.

Chapter 1.

Mapping Manila in the Late Eighteenth Century to the Nineteenth Century

¨[P]artly through the means of the city map:
the city and the map grew up side-by-side,
the one influencing the other¨[2]
- *Rule of Freedom, p.* 191

It is important to note that no map or printed sources in the late eighteenth century and the early nineteenth century used the term ¨Manila¨ to designate inclusively all the urban settlements in the bay of Manila. The city was typically called *¨la capital y sus extramuros¨* or *¨la ciudad y sus extramuros¨*. By the late nineteenth century, *¨Manila y sus arrabales¨* would be the often-used term in maps, plans, and other printed sources. One may argue that Manila technically refers ***only*** to Intramuros but Huetz de Lemps posits that ¨ [t]he use of the possessive *(¨sus¨)* shows that an organic link is recognized between the "capital" and the suburbs understood as a whole, but without the latter being clearly demarcated. ¨[3]

Reimagining the spatial composition of colonial Manila is both an easy and difficult task, depending on which part of the city we are looking at. For one, reconstructing Intramuros is relatively an easy task because Spanish colonizers and cartographers clearly defined the composition and demarcation of the walled city throughout the colonial period. As the seat of colonial power, it was only logical and essential that every street and corner of its urban space was described in detail ever since the earliest Manila maps and printed sources in the sixteenth up to the mid-eighteenth centuries- from the fortified city´s walls and gates, forts and defense installations, military barracks, churches, convents, *beaterios,* schools*,* hospitals, and other government edifices.[4] For instance, the names of streets of as well as the important structure of

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[2] Patrick Joyce, *The Rule of Freedom. Liberalism and the Modern City*, London and New York: Verso, 2003), p. 191.
[3] Xavier Huetz de Lemps, ¨Nommer la ville: les usages et les enjeux du toponyme ´Manila´ au XIXe siècle,¨ *Genèses Sciences sociales et histoire,* no. 33 (Année 1998), p. 32.
[4] See Daniel Gomá, ¨Control, Espacio Urbano e Identidad en la Filipinas Colonial Española: El Caso de Intramuros, Manila (Siglos XVI-XVII),¨ *Scripta Nova Revista Electrónica de Geografía y Ciencias Sociales* vol. XVI, no. 418 (1 nov 2012).; Pedro Luengo Gutiérrez, *Intramuros, Arquitectura en Manila,* (Madrid: Fundación Universitaria Española, 2012).; Lourdes Díaz-Trechuelo, *Arquitectura española en Filipinas 1565-1800*, (Sevilla: Escuela de Estudios Hispano-Americanos, 1959).; Lourdes Díaz-Trechuelo, Las construcciones de Manila de Legazpi hasta el siglo XVIII. In *Manila, 1571-1898: Occidente en*

Intramuros were already depicted in a 1783 map (See Appendix Chapter 1, A). [5] This is not the case for the suburbs though. One of the challenges of this investigation is to reconstruct the composition and boundaries of Manila´s arrabales. A profound understanding of Manila´s growth and metamorphosis would be incomplete without a clear-cut description and examination of each and every suburb´s make-up. While a lot of information is already available on which suburbs comprised *extramuros,* a discussion on *what comprised these suburbs* is still wanting. This chapter attempts to reimagine the configuration of the suburbs by utilizing two types of sources: Manila maps from distinct periods complemented with printed sources at the time.

Utilizing maps and plans culled from the AGI, AHN, and other libraries and repositories is one of the ways to reconstruct Manila´s growth and development. While there are several maps that were produced between the late eighteenth century to the nineteenth century, this research will highlight four Manila maps and utilize them to follow the evolution of the city´s spatial and built environment. The 1779, 1814, 1874, 1898 Manila maps and plans are effective primary sources in this task. These maps, complemented with reports from colonial officials and print sources through time could help us reimagine the city´s growth and evolution in a span of a century and a half. From these maps and written sources, perhaps we could answer some of the following questions: What suburbs and settlements composed Manila in the late eighteenth to the nineteenth century? How were the boundaries of each suburb set? What were the indicators of the suburbs growth and expansion? How did the political, economic, and military factors contribute to the changes in Manila´s urban ecology? How did Manila´s configuration in the second half of the Spanish colonial rule reflect the colonizer´s framework and polices?

It is equally important to note that Manila´s portuarial and riverine topography greatly shaped and defined the movement of the city´s residents. Its port offered anchorage to the multitude of vessels that linked the city to international and domestic trade. Manila´s urban sprawl is naturally divided by the Pasig river which flows through a myriad of estuaries or *esteros* that cut through the different districts of the capital. Since

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Oriente. Madrid: Ministerio de Fomento, 1998, p. 183-193.; Pedro Ortiz Armengol, *Intramuros de Manila, de 1571 hasta su destrucción en 1945* (Madrid: Ediciones de Cultura Hispánica, 1958).

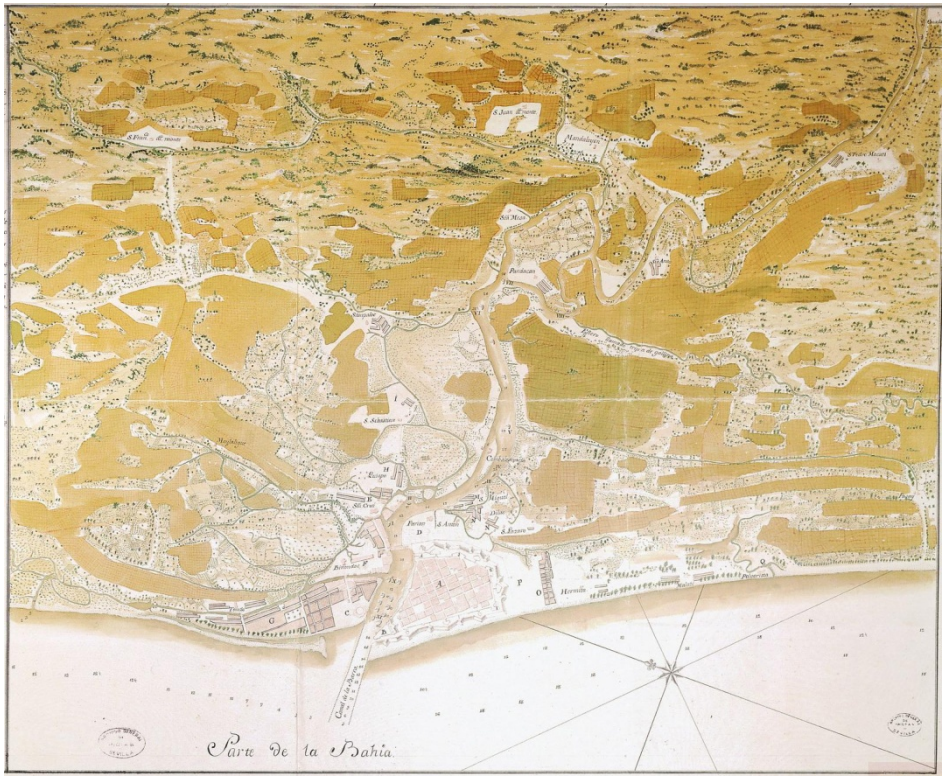
[5] AGI, MP-FILIPINAS, 229, Plano de la ciudad de Manila, capital de estas Yslas Philipinas, construido con el fin de manifestar el destrozo de sus edificios, según lo mandado en Decreto de 23 de abril de 1783 por el Muy Ylustre Señor Don José Basco y Vargas, Corregidor, de esta Noble Ciudad, Gobernador, Capitán General y Presidente de su Real Audiencia, 26 de junio de 1783. See Appendix Chapter 1, A.

the early days until the nineteenth century, the people of Manila depended on these tributaries for their mobility and linkage to the different suburbs even to the nearby provinces such as Laguna and Rizal. The need to improve the city´s cohesion amidst the growing commercial and portuarial activities resulted to the construction in the nineteenth century of more transportation and communication infrastructures. The oldest bridge that connected the two banks was España Bridge (previously known as Puente Grande), first constructed in 1630 and replaced with a stone and iron bridge after the 1863 earthquake. This bridge connected Intramuros to Binondo. In 1852, the Colgante Bridge was inaugurated which connected the suburb of Quiapo and Arroceros area (rice district) near Intramuros. This suspension bridge, was highly regarded as a triumph of engineering and technological development at the time. Lastly, in 1880, the Ayala Bridge was inaugurated to connect the suburb of San Miguel to the area of Concepcion located in the Ermita suburb.[6] The introduction of more modern technologies in improving urban mobility, especially the urban working class, and the movement of goods led to the establishment of *tranvías* in the capital and eventually the Manila-Dagupan railway system. In 1881, there were five horse-conducted street cars or *tranvías* that traversed the different suburbs. By 1888, some of these lines would be steam-powered and eventually be electric-powered in 1905 during the American rule.[7]

[6] Juan Guardiola, *El imaginario colonial: fotografía en Filipinas durante el periodo español 1860-1898.* Barcelona: Casa Asia, 2006. p. 36.
[7] Dídac Cubeiro, ¨Un Nuevo espacio urbano: el tranvía de Manila 1884-1935¨ *TST, Transportes, Servicios y Telecomunicaciones, Revista de Historia. Asosación Ibérica de Historia Ferroviaria.* Octubre 2018, n.p.; Elizalde (2017), pp. 63-100.

A. Reimagining Manila Through Maps: 1779, 1814, 1874, 1898

1779 Map: Manila in the late eighteenth century



Legend:

A- Plaza de Manila
B- Fort Santiago (*Fuerza o Castillo de Santiago*)
1-Bastion of San Diego *Baluarte de San Diego*
2-Bastion of San Andres (*Baluarte de San Andres*)
3- Bastion of Dilao (*Baluarte de Dilao*)
4- Bastion of San Gabriel (*Baluarte de San Gabriel*)
C- San Fernando royal warehouse (*Alcaicería de San Fernando*)
D- Arrabal of Parian
E- Arrabal of Sta. Cruz
F- Arrabal of Binondo
G- Arrabal of Tondo
H- Arrabal of Quiapo
I- Arrabal of San Sebastián
M- Arrabal of San Miguel
N- Arrabal of Dilao and San Lázaro
O- Arrabal of Santiago
P- Cleared lands after the last war (British invasion)
Q- *Polvorista* fort
I-Estero of Sta. Cruz
II- Estero of Quiapo
III- Estero of San Miguel
IV- Estero of San Lazaro
V- Estero of Pasay
VI- Estero of Sampaloc
VII- Estero of Pandacan
VIII- Estero where the Estero de Tripa de Gallinas enters
IX- Estero of Namaian
X-Two *vintillas*
XI- Vinta squadron in preparation for any possible Moorish attacks

Figure 1. Plan of the city of Manila and its environs, 1779.
Source: AGI, MP-FILIPINAS[8]

[8] AGI, MP-FILIPINAS, 93, Plano de los contornos, porción de la costa y bahía adyacentes a la ciudad y plaza de Manila, capital de las Yslas Filipinas, 1779.

Since the early cartographic descriptions of Manila, the colonial administrators consistently used the Pasig river as the principal topographical marker of the city. The understanding and mapping of the city´s configuration had always been in reference with the river. The Manila suburbs were categorized into two: those situated to the right bank or north of the Pasig river and those at the left bank or to the south of the river. The 1779 map is helpful in identifying the existing and growing arrabales of Manila after the British invasions in 1762-1764 and before the city´s reconfiguration projects undertaken by the last governor generals in the late eighteenth century.[9]

In the 1779 map, the known arrabales to the right side of the Pasig river consisted of Tondo, Binondo, Sta. Cruz, Quiapo, and San Sebastián. Meanwhile, San Miguel, Parian[10], Dilao and San Lázaro, and Santiago were the arrabales to the left side of the river. Aside from these suburbs, the map also identified other nearby towns of Sampaloc, Pandacan, Santa Ana, and Santa Mesa and other important places like San Pedro de Macati (*Makati*), Mandaloyon (*Mandaluyong*), San Juan del Monte, and San Francisco del Monte. Aside from the Pasig river, the importance of the estuaries or *esteros* in the configuration of the city was also reflected in this map as colonial cartographers and administrators identified the esteros of Santa Cruz, Quiapo, San Miguel, San Lázaro, and Sampaloc.

The 1779 map basically reflected a defense-oriented and militaristic configuration of Manila. This is not surprising since the map was produced only a decade and a half after the British invasions in Manila in 1762 to 1764. It highlighted the military garrisons, fortifications, and bastions of the city as well as the presence of ships in the mouth of the Pasig river and Manila bay in preparation for the anti-Moor campaigns and foreign invaders. Moreover, the map also showed some significant changes to the urban configuration of Manila after the British attacks. It documented one immediate after-effect of the attack- the heavy destruction of the settlements of Santiago and Bagumbayan which were located southeast of Intramuros. The two churches of Santiago and Ermita were used as points of attack in the battle for Manila. As consequence, the immediate expanse which used to be the locations of Santiago and Bagumbayan were cleared from

[9] A 1767 map also produced by military engineer Feliciano Márquez only identified the churches and convents outside of Intramuros. The map was also very defense-oriented emphasizing mostly the *baluartes* (bastions) and the fort.

[10] The 1779 map labelled Parian as an *arrabal*. This may be contentious since the Parian was a segregation space for Chinese *sangleyes*. The story of Parian had been connected to the cyclical expulsion and reinsertion story of the Chinese immigrants in Manila.

any communities. (See Legends O and P in the 1779 map) By the nineteenth century, Santiago ceased to exist as an arrabal and Bagumbayan became an open field and part of the *Paseo de Luneta.*

After the British invasions, the Spanish colonial government became wary of any possible foreign attacks in the capital. The administrations of three governor generals in the Philippines- José Basco y Vargas (1778-1787), Félix Berenguer de Marquina (1788-1793), and Rafael María de Aguílar (1793-1806) undertook efforts in strengthening the defences of the colony´s principal city. Part of the city´s reorganization after the British invasion was the establishment of a security radius around Intramuros. These fortification measures affected the layout of the city as settlements and barrios were ordered demolished and constructions of houses close to the walled city were prohibited. These meant the extermination of communities, the loss of the humble homes, and the displacement of many Manila residents.

Aside from the settlements of Santiago and Bagumbayan, more communities including Parian, Dilao, San Lázaro, San Antón, and San Miguel were directly affected by these orders. The 1779 map still showed these settlements beyond the walls of Intramuros on the left side of the Pasig river. In 1783, Basco y Vargas communicated the order to demolish the arrabales of Parian, Dilao, and San Lázaro and clear the vicinity within a fifteen thousand *varas* radius (around twelve kilometers) for the establishment of the fortification projects of the city. Strong opposition to this measure led the colonial government to suspend the dismantling of the suburbs. However, a royal order on 5 May 1786 reiterated the need to clear the area and prohibit the construction of settlements near the walled city.[11] In 1791, during Berenguer de Marquina´s (1788-1793) rule, royal orders commanded the removal of more settlements to the northeast side of Intramuros. These pertained to San Miguel, San Antón, and Parian. Carrying out the demolitions proved to be a difficult and almost cyclical task for the government as Berenguer de Marquina and Aguilar promulgated repetitive decrees on the eradication of all *nipa* houses within the security radius of Intramuros for they ¨did not only ruin the physical appearance of the city but also greatly served the British attack due to the houses' easy combustion¨.[12]

[11] María Lourdes Díaz- Trechuelo, *¨La Defensa de Filipinas en el último cuarto del Siglo XVIII,¨ Anuario de Estudios Americanos XXI* (1964), pp. 151-152.
[12] José Montero y Vidal, *Historia General de Filipinas desde el Descubrimiento de Dichas Islas hasta Nuestros Días*. Vol. II, p. 339.

The 1814 map: Manila´s configuration in the early nineteenth century

Legend:

A- Usares de Luzon military barracks
B- Revenue office for *bonga (Administración de la renta de bonga)*
C- Revenue office for spirits (*Administración general y talleres de la renta del vino*)
D- General office of tobacco Factory and warehouse (*Dirección general de tabaco, almacenes y fabrica*)
E- Infrantry barracks (*Cuartel de Infantería)*
F- Alcaicería de San Fernando
G- Cavalry barrack (Cuartel de Caballería)
H- Estero of Arroceros

Figure 2: Plan of the plaza of Manila and its environs, 1814.
Source: AGI, MP-Filipinas, 133, Plano de la Plaza de Manila y sus contornos por Ildefonso de Aragón, comandante de ingenieros, 4 de enero de 1814.

More than three decades after the publication of the 1779 map, the changes on the city´s organization were clearly shown in the 1814 map produced by Ildefonso de Aragón, *comandante de ingeniero* of Manila. The map provided a clear image of the eliminated arrabales as a result of the fortification and construction policies implemented by the government. The area labelled ¨*terrenos adictos a las fortificaciones*¨ belonged to the previously inhabited areas of Santiago, Parian, Arroceros, San Miguel, San Antón, and the smaller settlements of San Lázaro, and Dilao. Santiago was demolished and became an obscured territory in the nineteenth century while San Miguel and San Antón found new locations on the other side of the river.

Through this map, we know that in the early nineteenth century, San Miguel, San Antón, and Sampaloc became part of the suburbs to the right of the river joining the already established arrabales of Tondo, Binondo, Santa Cruz, Quiapo, and San Sebastián. By the mid-nineteenth century, San Miguel rose as one of the nineteenth-century bustling suburbs of Manila. Sampaloc, which was not labelled as an arrabal in the 1779 map, was included due to its increasing economic importance and growing number of inhabitants. By this time also, the settlements of Paco, Dilao, and Peña de Francia were unified to form San Fernando de Dilao. Alongside Ermita and Malate, the three settlements formed the arrabales to the left side of the Pasig river. However, different colonial sources were unclear of the status of these settlements, some labelling them as towns or *pueblos* and some as suburbs or *arrabales.*

According to Aragón, the jurisdictions and boundaries of the suburbs were primarily defined by the esteros, small rivers (*riachuelos*), and principal streets. Although these tributaries were clearly reflected on the map, the borders of each suburb still remained unclear. Moreover, while street naming and house numbering in Manila was first decreed in the late eighteenth century, majority of the city´s thoroughfares remained unknown in this map 1814 map. Therefore, determining the scope and extent of each arrabal was quite impossible during the time. It was only known that during this time the arrabales were governed by eleven gobernadorcillos composed of eight *jueces de naturales* and three *jueces de mestizo sangley*.

Compared to the 1779 map, the 1814 map reflected the growing economic activities in the capital, a result of the economic reforms pushed in the late eighteenth century, as importance were given to structures like the tobacco factory and warehouse (D in the map), the *Real Alcaicería de San Fernando* (F) as well as the colonial

government´s offices for the administration of the wine and betelnet (*bonga)* industries (B and C).

A more refined illustration of the colonial built environment could be observed in the 1814 map as it presented a more descriptive layout of the city, specifying the areas with masonry buildings (areas shaded in red) and constructions in the city which were made of light materials (areas shaded in light green). Intramuros and some parts of the commercially-vibrant suburbs of Binondo, Sta. Cruz, and Quiapo had constructions made of heavy materials in the early nineteenth century. Meanwhile, majority of the houses and dwellings of the natives in the southernmost part of Binondo (area close to the bay), Tondo, Sta. Cruz, Quiapo, San Miguel, and Sampaloc as well as the settlements to the left bank of the river such as Ermita, Malate, and San Fernando de Dilao were constructed with light materials. This demarcation of structures was recurring cause of concern for colonial administrators in Manila which would lead to policies concerning the city´s urban layout and sanitation.

As already pointed out in the introductory chapter, the late eighteenth and early nineteenth century signalled the beginning of an upward trend in Manila´s population. In 1810, Intramuros and the suburbs recorded a population of around 74,697 inhabitants. The 1814 Aragón map provided this population distribution using the 1810 census.

Manila Settlements (Intramuros and its Suburbs)	**Population According to the 1810 Census**
Binondo, Tondo, Santa Cruz, Quiapo, San Sebastián, San Miguel, San Antón, and Sampaloc (the suburbs to the right of the Pasig river)	53,571
San Fernando de Dilao (composed of Paco, Dilao, Peña de Francia, and Santiago)	4,711
Hermita	2, 372
Malate	6, 043
Intramuros (excluding the military personnel)	8,000
Total	**74,697**

Table 1: Distribution of Population. Intramuros and the suburbs from the 1810 census[13]
Source: AGI, MP-Filipinas, 133.

[13] AGI, MP-Filipinas, 133. ¨Plano de la Plaza de Manila y sus Contornos por Ildefonso de Aragón¨. 4 de enero de 1814. Also reported were the number of inhabitants of nearby towns. By this time, the nearby towns of Pandacan and Santa Mesa had 2,270 and 5,123 inhabitants respectively.

The 1874 map: A more complex city

Figure 3: Map of Manila and its arrabales, 1874.
Source: AHN, Ultramar, MPD[14]. Map edited and improved by Costelo, 2018.

[14] AHN, Ultramar, MPD. 4587, Proyecto de conducción de aguas a Manila: Distribución: Hoja nº 1: "Plano de Manila y sus arrabales con las líneas de la distribución de las aguas por Genaro Palacios, 30 abril 1874.

Manila´s exponential evolution and growth in the middle to the third quarter of the nineteenth century could perhaps be best imagined in an 1874 map by civil engineer Genaro Palacios. The map is Palacios´ proposal on the water lines that would supply Intramuros and the arrabals with potable water. Aside from the water distribution lines, the map´s richness is embedded through its exhaustive rendering of Manila´s barrios, streets, public spaces, bridges, plazas, gardens, houses and edifices made of strong and light materials alike, and other city infrastructures (finished or still under construction). Perhaps, Palacios´ map was one of the earliest to meticulously depict a street-level cartographic representation of the city. These details and information reflected the evolving complexity of Manila´s urban fabric at the time.

By the mid- nineteenth century, the principal arrabales of Manila consisted of Binondo, Tondo, Sta. Cruz, Trozo, Quiapo, San Miguel, and Sampaloc, Ermita, Malate, and San Francisco de Dilao/Paco. However, it is interesting to note that it was only on 1 September 1859 that a royal decree was promulgated to officially recognize the suburbs of Binondo, San José or Trozo, Santa Cruz, Quiapo, San Miguel, Sampaloc, and Tondo as part of the Corregimiento of Manila.[15] Ermita, Malate, and San Francisco de Dilao or Paco would be incorporated *legally* much later towards the end of the nineteenth century. However, archival documents reveal that the three were already considered de-facto suburbs even before this decree. By the mid- nineteenth century, San Sebastián and San Antón which were formerly considered as arrabales in the 1814 map ceased to be labelled as such during the time. Most of San Sebastián and San Antón became part of Quiapo and Sampaloc. The *Isla de Convalecencia* where the San Juan de Dios Hospital was located became a part of San Miguel. It was also noted that although officially considered as a barrio that constituted Manila´s urban sprawl, Trozo´s seeming obscurity in the map only affirmed its little importance.

In 1859, an official census registered Manila´s inhabitants to around 254,752.[16] The census, however, did not specify in detail the distribution of residents per district and arrabal. Compared to the population data gathered in the year 1840s by Tomás Cortes, a military engineer tasked to produce one of the earliest studies for the Manila waterworks, the population of Manila and its suburbs was recorded to have reached 218,724. This

[15] Ramón González Fernández en colaboración con Federico Moreno y Jerez*, Manual de Viajero en Filipinas*, (Manila: Estab. Tip. de Santo Tomás, 1875), p. 77.; Susana María Ramírez Martín, *El terremoto de Manila de 1863*: *medidas políticas y económicas* (Madrid: Consejo Superior de Investigaciones Científicas, 2006), p. 40.
[16] AHN, Ultramar, 5174, Exp. 15, Censo tributario y civil de Filipinas de 1859.

number was more or less three times larger than the population record of 1810. Given this discrepancy, it would be safe to say that during the time, Manila´s populace was around 220,000- 250,000. The following table demonstrates the inhabitants´ distribution per district or arrabal as provided by the Cortes´ plan.

District/ Arrabal		Population
Plaza de Manila (Intramuros)	Europeans	3,788
	Natives	2,500
	Military	7,000
	Total	**13,2888**
Tondo		37,588
Binondo		57,048
Santa Cruz		19,768
Quiapo		9,960
Sampaloc		11,456
San Miguel		4,432
Paco		11,212
Ermita		17,680
Malate		19,292
Chinese		6,000
	Total	**208,724**
	Temporary residents	10,000
	Final Total	**218,724**

Table 2: Population data produced by Tomás Cortes and used as one of the references by Genaro Palacios in the Manila waterworks project, ca. 1859-1869.
Source: AHN, Ultramar, 491[17]

The table affirms some observations of Manila´s urban configuration at the time. First, it confirms the continued densification of the city, especially in the suburbs to the right of the Pasig river where the concentration of business establishments was recorded. The two suburbs with the highest population were Binondo- a highly commercial suburb with an equally complex population strata composed of Spanish peninsulars, criollos, mestizos, Chinese, and natives, and Tondo- a predominantly native settlement of urban workers and laborers. Second, it records, at least in numerical statistics, a colonial society with a strong Chinese presence, foreign residents, and the European and native population

[17] AHN, Ultramar, 491, Exp.2. ¨Aprobación del proyecto de abastecimiento de aguas potables a Manila: Sobre un legado dejado para surtir de agua potable a Manila. Proyecto de Genaro Palacios. 1859-1869¨.

groups. Manila´s heterogeneous population played an important factor in its urban transformation. This heterogeneity was observed very evidently in the nineteenth century as commented in the *Manual de Viajeros*: ¨All the surroundings of the suburbs are extremely delightful and picturesque and its lively vegetation brings together the varied population where the Chinese, the native, and the European are blended and mixed up.¨[18]

The four burgeoning suburbs on the right bank of the river: Binondo, Sta. Cruz. Quiapo, and San Miguel

Despite the extant number of works that provide an exhaustive description of the arrabales of Manila and their socio-economic character, a definitive reconstruction of their confines and street composition remains an unaccomplished task. The more intensified campaigns on street naming converted Manila into a more legible space by the nineteenth century. Remaking the boundaries of each suburb and their arterial distribution became possible with the utilization of more detailed and street-specific maps such as the 1874 Palacios plan complemented with other printed sources during the time. However, an elaborate and almost complete street reconstruction could only be limited to the more affluent suburbs of Binondo, Santa Cruz, Quiapo as the rest of the suburbs still lacked street designation by this time. For instance, the highly dense district of Tondo with more or less 40,000 residents had only seven identified streets namely: Aceiteros, Pescadores, Bilbao. Ilaya, Quesada, Santa María and Azcárraga. A more detailed reconstruction of the street configuration of Tondo, Sampaloc, Dilao/Paco, Ermita, and Malate would be plausible by the end of the nineteenth century.

[18] González Fernández (1875), p. 77.

Binondo

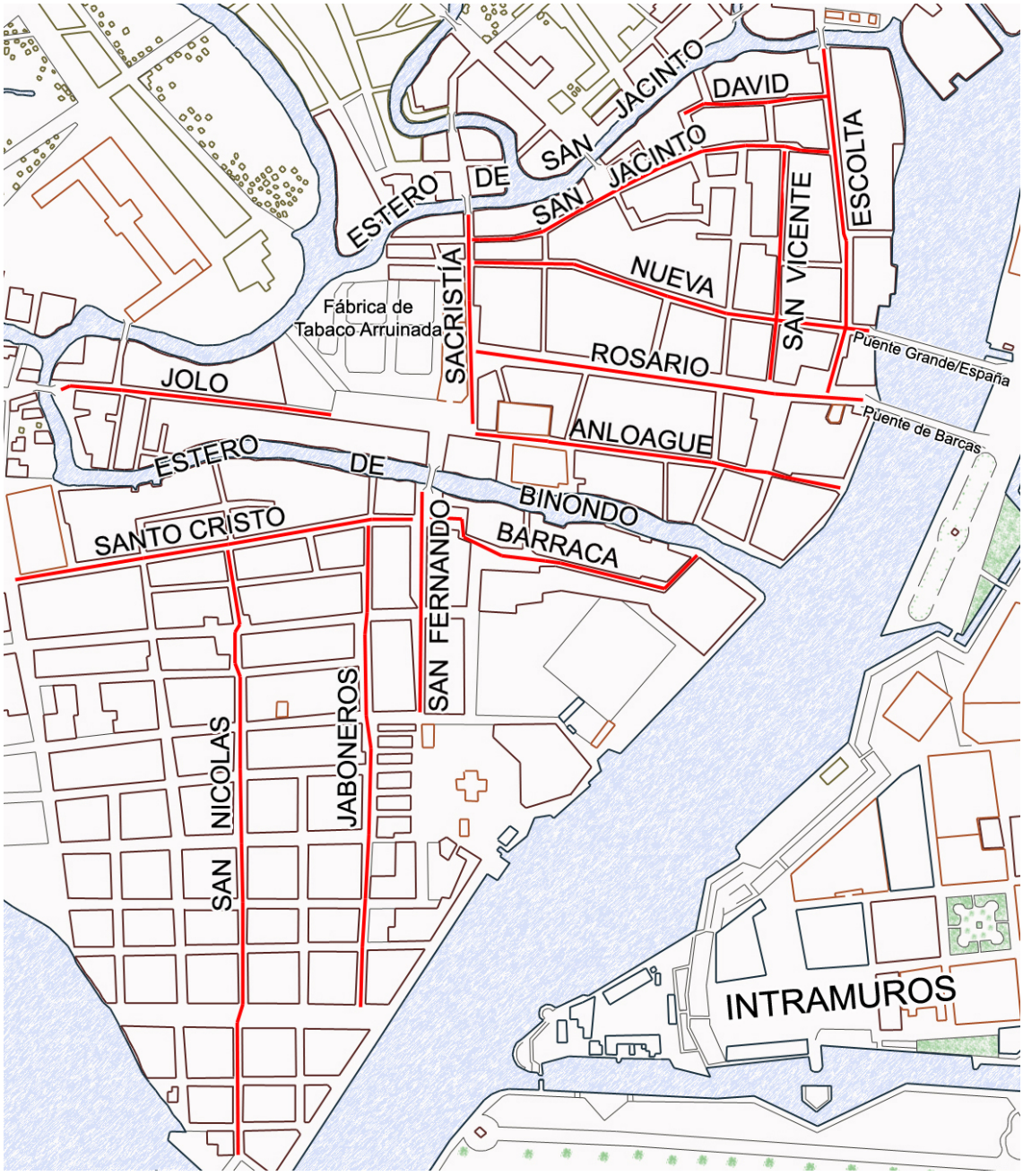


Figure 4: A reconstructed map of Binondo showing the named principal streets of the suburb in the middle to the last quarter of the nineteenth century.[19]
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (Ultramar, MPD. 4587; González Fernández, 1875)

[19] Some Binondo streets, mentioned in print sources at the time, were not depicted in this map such as San Antonio, Olivares, Condesa, San Vicente, San Fernando, Barraca, San Sebastián, Candelaria, Ilang-ilang, Caballero, Murallón, and Fundidor due to inconsistency of cartographic basis. Some of these thoroughfares pertained to the barrio of San Nicolás which were in the process of street reconfiguration at the time. By the last years of the nineteenth century, these streets would already be clearly outlined. See Map 8.

While Binondo could be the most well-documented arrabal among Manila´s suburbs,[20] a clear reconstruction of its street composition and boundaries is still an incomplete task. Figure 4 is an attempt to reconstruct the extent and boundary of Binondo during the mid- nineteenth century primarily utilizing printed sources and corroborated with the 1874 Palacios map. The *esteros* of Binondo and San Jacinto were essential border markers of the suburb. While there were no specific legislations with regard its territorial demarcation, it seemed that by this time the barrio of San Nicolas constituted Binondo. However, by the late nineteenth century, San Nicolas was formally declared as one of the eleven separate districts that comprised the jurisdiction of Manila. Many principal Binondo´s streets were already named and numbered by this time- a result of the heightened impulse of transforming the city into a decipherable urban space to facilitate colonial administration. (See Chapter 4)

Binondo was regarded as the premiere central business district of the capital by the nineteenth century evoking a sense of cosmopolitanism with the presence of British, American, French, German, and European trading firms and Chinese merchants.[21] Numerous commercial entities, merchants, traders, business companies, and textile and fashion shops[22] were listed in this arrabal. The busiest streets of Escolta and Sto. Cristo were lined with all sorts of establishments, from restaurants, cafés to hotels, to drug and herbal stores (*boticas*), wineries, hardware stores, and specialty shops. By the mid-nineteenth century, important commercial government institutions were located in the area such as the Administration for Revenue (*Administración Central de Rentas Estancadas),* the general warehouse and factory of tobacco as well as the Administration of Treasury (*Administración de Hacienda*).[23]

Many *criollos* and mestizos established their place of residence in Binondo. Even Spanish *peninsulars* who traditionally resided inside the fortified city of Intramuros also put up their second residence in this suburb. There were reports that by the nineteenth

[20] See: Richard T. Chu, *Chinese Merchants of Binondo in the Nineteenth Century,* Manila: University of Santo Tomás, 2010; Lorelei D.C. De Viana, *Three Centuries of Binondo Architecture, 1594-1898: A socio-historical perspective*, Manila: University of Santo Tomás, 2001.

[21] Benito Legarda, *After the Galleons: Foreign Trade, Economic Change and Entrepreneurship in the Nineteenth-Century Philippines* (Quezon City: Ateneo de Manila University Press co-published with the University of Wisconsin- Madison Center for Southeast Asian Studies, Second reprint 2002).

[22] Stephanie Marie Coo, ¨Clothing and the colonial culture of appearances in nineteenth century Spanish Philippines 1820-1896¨ Université Nice Sophia Antipolis, 2014, Doctor of Philosphy Dissertation, p. 409. In her dissertation, Coo documents the European and native textile shops that dotted the streets of Binondo in the nineteenth century, from the retailers to *sinamayeras and bordadoras,* which served the market demand of the society´s elite as well as the growing urban middle class.

[23] González Fernández (1875), pp. 78-80.

century, some areas of Intramuros evoked an image of neglect as more Spanish residents converged in the Extramuros. Binondo was home to almost all Chinese who were known for their role in the commercial activities and labour services. It was reported that it had some of the widest and beautiful streets, which measured a width of fourteen to sixteen meters. Most of them, however, were not aligned and well-organized.

As already mentioned, the suburb´s vitality to the seat of government was physically connected through the España bridge. It linked the Manila´s traditional political, religious, and military center in Intramuros and Escolta, regarded as a principal artery to the network of commerce and movement in nineteenth-century Manila.

Santa Cruz

Figure 5: A reconstructed map of Santa Cruz showing the named principal streets of the suburb in the middle to the last quarter of the nineteenth century.[24]
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (Ultramar, MPD. 4587 ; González Fernández, 1875)

Santa Cruz´s boundary was defined by three esteros that separated it from its contiguous suburbs of Binondo, Trozo, and Quiapo. The estero of San Jacinto separated Santa Cruz from Binondo, the estero of Trozo from the suburb of the same name, and the estero de Quiotan from Quiapo. Once these tributaries were traced, a precise delimitation

[24] Similar to Binondo, more streets would be added in Santa Cruz by the end of the nineteenth century. See Map 8.

of Santa Cruz could be produced. This suburb seemed a ¨suburb of two islands¨ because it was divided into two by one more estero called estero de Sibacon.

Like Binondo, the streets of Santa Cruz at the time was reconstructed in Figure 5 The street of Dulumbayan, which literally means ¨end of the town¨, was contiguous to the ¨frontier¨ district of San Lázaro-Dulumbuyan[25] but its importance was central in Manila´s network of food provisioning due to the slaughterhouse in the area. The suburb was also home to numerous commercial establishments and residential areas.

By the mid- nineteenth century, some of the other important structures found in Santa Cruz included the hospital for lepers managed by the Franciscans, a theatre called *El Circo*, and the public prison of Bilibid. A parcel of land called *La Loma* was situated further north of Santa Cruz where the old Chinese cemetery was located while a land called Mayjaligue was an agricultural field where rice, corn, and sugar were planted amidst the rapidly urbanizing suburb. By the 1880s, the new general cemetery of Manila would find its location beside the Chinese cemetery on the hills of La Loma.

[25] Xavier Huetz de Lemps documents the emergence of this barrio as a result of the government´s policy of moving the poor urban inhabitants to the city´s ¨frontiers¨ to prevent them from building fire-prone houses in masonry areas. See: Xavier Huetz de Lemps, ¨L'inclusion conflictuelle dans les faubourgs de Manille d'une *hacienda* franciscaine (San Lázaro-Dulumbayan, 1860-1898) ¨ (in press)

Quiapo

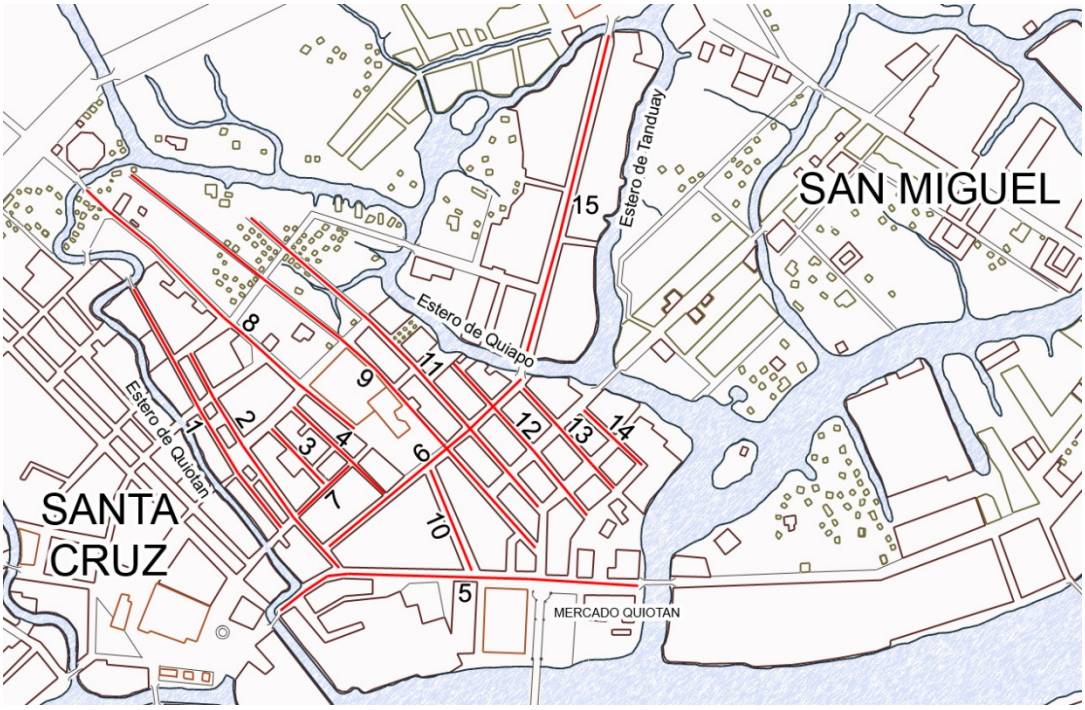


Figure 6: A reconstructed map of Quiapo showing the named principal streets of the suburb in the middle to the last quarter of the nineteenth century.[26]
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (Ultramar, MPD. 4587 ; González Fernández, 1875)

LEGEND

1 – Quiotan	2 – San Roque	3 – Platería	4 – Palma
5 – Echagüe	6 – General Crespo	7 – Carriedo	8 – San Pedro
9 – Santa Rosa	10 – Villalobos	11 – Concepción	12 – Barbosa
13 – Elizondo	14 – Gunao	15 – San Sebastián	

Like Santa Cruz, *esteros* were also the principal delineators of Quiapo such as the esteros of Quiotan, Quiapo, Curtidor, and Tanduay. Towards the late nineteenth century, enormous changes would occur with regard the configuration of these tributaries. During the time, the suburb was well known for its church and plaza. Quiapo church was one of the heavily destroyed structures in the arrabal after the 1863 earthquake. Quinta market, which was one of the principal spaces in terms of city food supply, was located in Quiapo near the Pasig river.

In 1852, a bridge was inaugurated to connect Quiapo and Arroceros, a parcel of land beyond the walls of Intramuros on the left side of the Pasig river. Called *Puente*

[26] More streets would emerge in the suburb of Quiapo by the end of the nineteenth century. See Figure 8.

Colgante, the bridge was funded by the Basque merchants Ynchausti and Company. The Basque engineer Matías Mechacatorre, designed the structure which had dimensions of 110 meters in length and 7 meters in width. It had two lanes for carriages and carts and a space pedestrians crossing the river. However, the bridge was not free for use. A toll had to be paid to be able to cross the bridge (one *cuarto* toll for each person; 10 *cuartos* for a four-wheel carriage; 5 *cuartos* for a two-wheel carriage, and 3 *cuartos* for each horse.[27]

[27] González Fernández (1875), pp. 81-82.

San Miguel

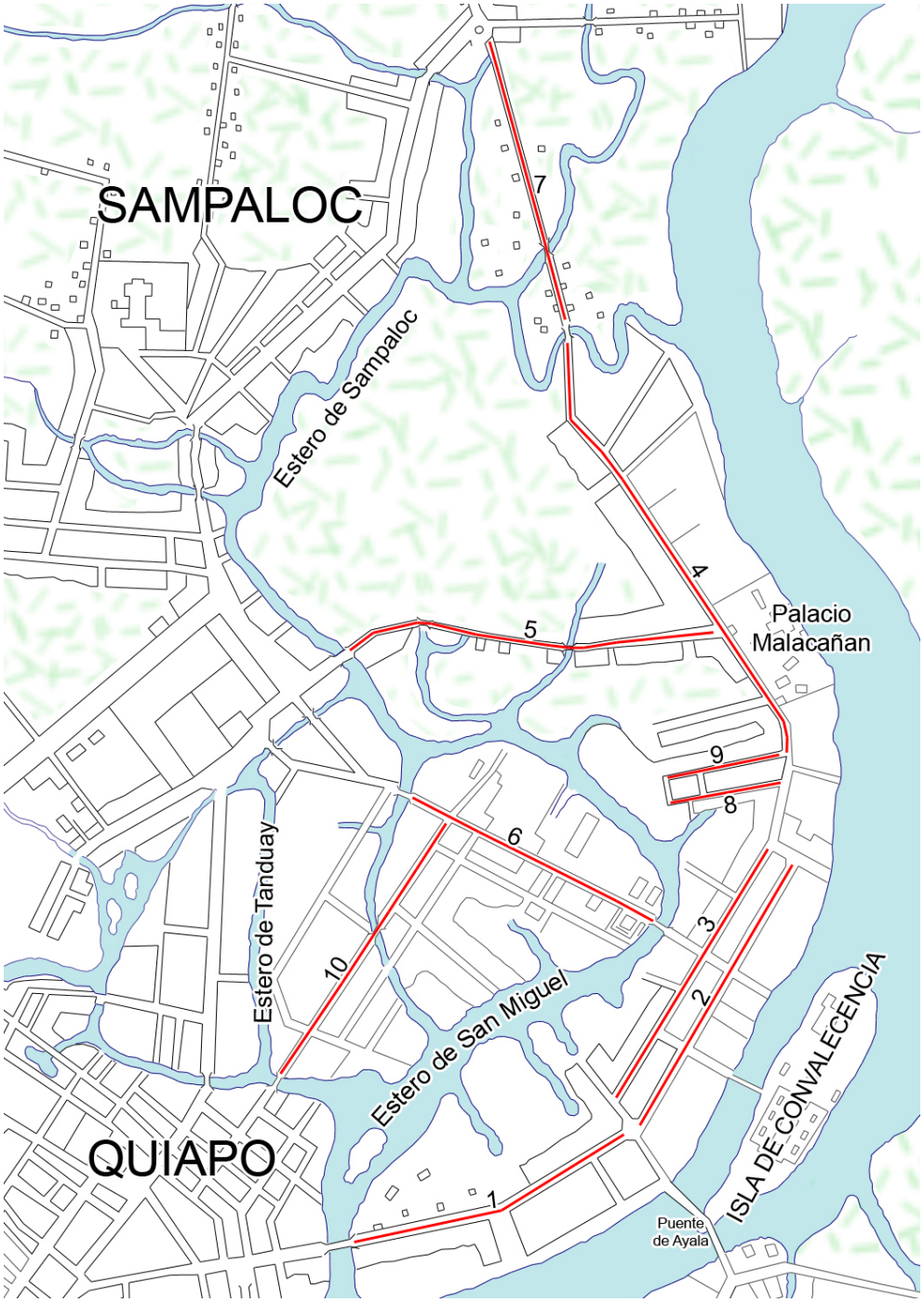


Figure 7: A reconstructed map of San Miguel showing the named principal streets of the suburb in the middle to the last quarter of the nineteenth century.[28]
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (Ultramar, MPD. 4587 ; González Fernández, 1875)

LEGEND

1 – Rosario	2 – Solano	3 – Novaliches	4 – Malacañan
5 – San Rafael	6 – Tanduay	7 – Calzada de Uliuli	8 – Santa María Magdalena
9 – Caculi	10 – San Gerónimo		

[28] Like Binondo, Sta. Cruz, and Quiapo, the street configuration of San Miguel would become more complex by the end of the nineteenth century. See Map 8.

Of all the arrabals in nineteenth century-Manila, San Miguel seemed to be the most isolated one. Surrounded by esteros, the suburb was at first known as a residential area filled with beautiful gardens and houses, location of the governor general´s palace, and eventually the location of several important manufacturing companies. The suburb was connected to nearby Quiapo through a wooden bridge, the Quinta bridge. Many houses, characterized by their beautiful baths and gardens, located in the Pasig river bank served as recreational houses for many Spanish and European residents of Manila. However, majority of the settlements in the suburb constituted houses made of light construction materials such as *tabla and nipa.*

The island of Convalescence also pertained to the suburb of San Miguel. The island served as a quarantine site, and the location of a hospital and hospice of the city. (*Hospital de la Convalecencia, Hospicio de San José y casa de dementes*). A bridge was constructed that connected San Miguel to the other side of the river in the barrio of Concepcion located north beyond Intramuros which led to the suburb of Paco.

In the second half of the nineteenth century, San Miguel became a locus of important manufacturing establishments. In the 1850s, a steam-powered sugar refinery owned by the Ynchausti and Company was listed in Tanduay Street.[29] By the 1890s, a brewing factory owned by Enrique M. Barretto y Ycaza, was inaugurated which eventually became the *Cervecería San Miguel.*[30] The refining factory which initially started near the banks of the Pasig river took a meteoric rise in the international market under the leadership of Andrés Soriano in the next century. It was one of the companies, along with the Tobacco General Company and Elizalde and Company, that sustained Spanish presence in post-Spanish Philippines while adopting to the new political and socio-economic realities during the American dominion in the islands.[31]

[29] Legarda, p. 317

[30] María Dolores Elizalde, ¨Interacciones empresariales entre las élites urbanas Filipinas: Barcos, tranvías, cervezas y aceites,¨ in María Dolores Elizalde and Xavier Huetz de Lemps (eds), *Filipinas, Siglo XIX. Coexistencia e interacción entre comunidades en el imperio español,* Madrid: Ediciones Polifemo, 2017, p. 91. Eventually Barretto would find business partners in Manila´s *empresarios* such as Pedro Roxas, Gonzalo Tuason y Patiño, Vicente D. Fernandez among others.

[31] Florentino Rodao García, ¨Las compañías españolas después de la Revolución Filipina,¨ pp. 560-561 in Miguel Luque Talaván, Juan José Pacheco Onrubia, Fernando Palanco Aguado (coordinadores) *1898: España y el Pacífico Interpretación del Pasado, Realidad del Presente* Asociación Española de Estudios del Pacífico, 1999.

The 1898 map: Manila during the last years of Spanish rule

Figure 8: Map of Manila and its arrabales, 1898.
Source: University of Michigan Special Collections (accessed online)

This 1898 map is one of the most elaborate and extensive cartographic rendering of Manila and its environs before the turn of the century. The map which was printed by Imprenta Litografía Ramón Montes in Manila was attributed to Francisco Javier Gamoneda, a graduate of Architecture from the Universidad Central de Madrid who arrived in the Philippines in 1896 and became a writer for *Diario de Manila* and *El Comercio.*[32] By this time, a more detailed and comprehensive street marking was observed in the city, a proof perhaps of the multiplied improvement measures in the urban lay out of the capital. The once poorly-labeled districts of Tondo, San Nicolás, Sampaloc, Dilao/Paco, Ermita and Malate were already significantly cartographed making the recreation of the borders and street composition of the districts plausible. It also mapped the changes in the urban street configuration- for instance, the emergence of new streets out of covered up *esteros.* Comparing the 1874 and 1898 maps to those that appeared in the early 1900s would show that the course of some esteros changed significantly during this time. For instance, the esteros of Sibacon and Quiotan, which appeared in the 1874 map, were cut, covered, and paved in 1898. The estero of Quiotan was renamed *Estero Cegado Street* which literally means ¨covered estero¨. By the 1920´s these two esteros would be practically imperceptible in the map. The esteros of Tanduay in San Miguel and the surrounding esteros in the Isla de Meisic would also disappear by 1920.[33] Although some parts of the estero Meisic in Tondo, where the tobacco factory was located, would already be obstructed in the late 1890s to make way for the tracks of the Manila-Dagupan railway.

The map is also an excellent source of an updated rendering of the infrastructural projects and urban services that were carried out in the last quarter up to the last years of the century. Aside from those that were already *mapped* in 1874 (e.g. waterworks lines, botanical garden, promenades, parks, markets, and slaughterhouses, cemeteries, prison), the last urban infrastructure projects were depicted in the 1898 map such as the port of Manila, the stations and lines of *tranvías,* the railway system, and modernizing institutions such as the Meteorological Observatory.[34] For instance, the massive and

[32] Xavier F. Coronado, *Francisco Gamoneda: Librero, Archivero y Bibliotecario. El conocimiento como trama de una existencia* (Educación y Biblioteca, 2006), p. 52. According to Coronado, this plan was incorporated in Souvenir *of the 8th Army corps Philippines Expedition. A Pictorial History of the Philippines Campaign.* Manila: Imprenta Montes, 1899, a book that Gamoneda supposedly published. However, the digitized copy of the book in the University of Michigan digital library does not make any mention of Gamoneda.

[33] See Appendix Chapter 1, B for the 1920 Manila Map.

[34] Some extant researches on the Manila port project are the following: Dídac Cubeiro, ¨Modernizing the Colony: Ports in Colonial Philippines 1800-1908¨ *World History Connected* vol.14.3 Illinois University

lengthy port infrastructure project to widen and modernize the Manila harbour initiated in 1880 is brought to the fore. The Philippine Light Railway Company in 1889 was reported to have established four lines that joined the suburbs of Santa Cruz and Tondo, Sampaloc, Intramuros, and Malate. The stations of these *tranvías* could be located in the 1898 map as well as the Manila-Dagupan railway station in Tondo. It also clearly located the network of other important structures in the cityscape such as hotels, factories and the expanding urban sprawl with the different military, religious, and civil edifices as well as the blocks of settlements made of strong and light materials. However, there were still other urban projects that were not marked in the 1898 map such as the port lighthouse project (aside from one lighthouse), street public lighting, telegraph, even the newly-opened city cemetery of La Loma.

On 19 January 1894, a royal decree (See Appendix Chapter 1, C) officially named the eleven suburbs that constituted the municipal territory of Manila which consisted of Tondo, Binondo, Trozo, Santa Cruz, Quiapo, Sampaloc, San Miguel, San Fernando de Dilao/Paco, Ermita, Malate, and San Nicolas. The last suburb to be incorporated was San Nicolas which comprised the territory from the estero of San Nicolas all the way west leading to Manila bay. All suburbs pertained to a separate parish except San Nicolas which was still part of the Binondo spiritual territory. The royal decree clarified that all matters regarding the municipal jurisdiction of Manila would be agreed by the city council with the approval of the governor general and the *Dirección General de Administración Civil* and the *Consejo de Administración*.[35]

Press, Hawaii University, Nov. 2017; Xavier Huetz de Lemps, ¨Las remodelaciones portuarias de Manila en el siglo XIX: la ingeniería colonial frente a las dificultades medioambientales,¨ in Elizalde and Huetz de Lemps, (2020), in press.

[35] *Ayuntamiento de Manila: Exposición y Real decreto de 19 de enero de 1894* (Manila: Imp. de la R. Mercantil de José de Loyzaga, 1894).

A richer urban cartography of the other suburbs in the right side of the river bank: Tondo and Sampaloc

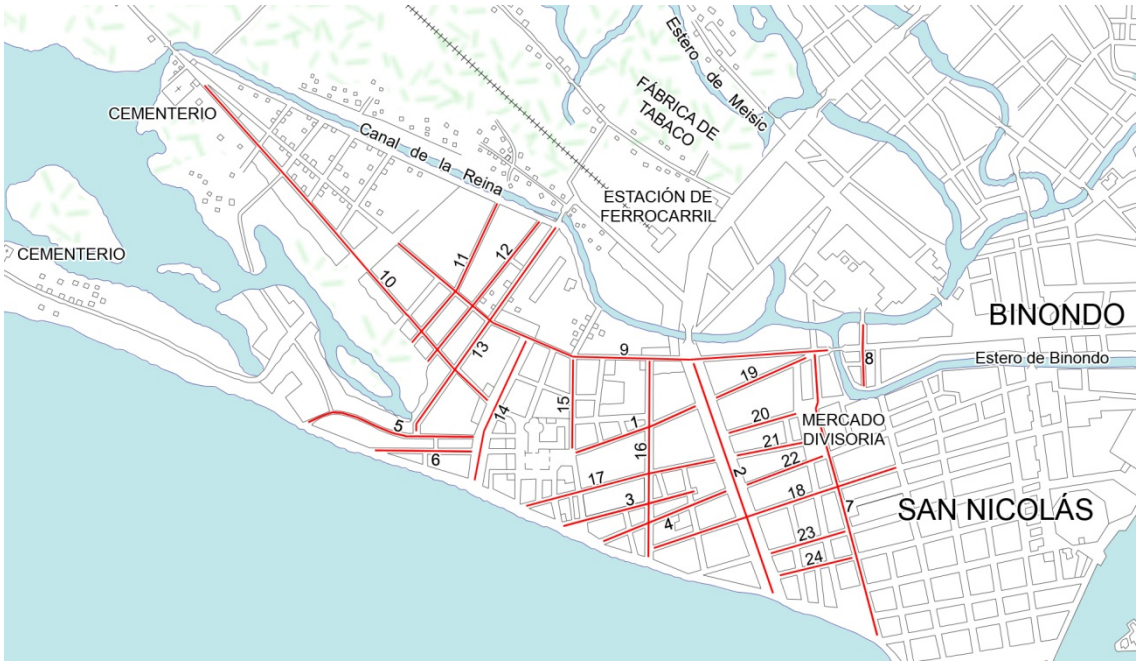


Figure 9: A reconstructed map of Tondo showing the named streets of the suburb in the last years of the nineteenth century.[36]
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (*Plano de Manila y sus arrabales, 1898*)

LEGEND

1 – Ilaya	2 – Azcárraga	3 – Bilbao	4 – Pescadores
5 – Santa María	6 – Quesada	7 – Aceiteros	8 – Meysic
9 – Lemery	10 – Sande	11 – Pavía	12 – Ricafort
13 – Moriones	14 – Morga	15 – P. Herrera	16 – Rada
17 – Fulgueras	18 – Salinas	19 – Ilaya	20 – Tabora
21 – Acuña	22 – Sagunto	23 – Encarnación	24 – Soledad

The lands to the east of Trozo up to the bay pertained to Tondo, a suburb of more than two-kilometers distance from Intramuros. It was separated from Binondo by a *divisoria*, which then became the name of the market situated in the area. A river coming from the nearby pueblo of Malabon ran through the center of Tondo.

By the second half the nineteenth century, one out of the five big tobacco factories was in the barrio of Meisic in Tondo. The other two were in Arroceros (*Fábrica de Arroceros and Fábrica de Fortín de Arroceros*) in the left bank of the Pasig river while the remaining two were in Cavite and Malabon. The Fábrica de Puros in Tondo was said

[36] In the mid-nineteenth to the last quarter of the century, the only decipherable streets in maps were Aceiteros, Pescadores (which became part of Santo Cristo in Binondo), Bilbao, Ilaya, Quesada, and San Maria. See Figure 8.

to have employed no less than 6,000 cigar makers and factory workers while the ones in Arroceros had 1,500 and 8,000 respectively. Many of these workers, mostly women *cigarreras*, came from the different suburbs of Manila and the nearby Luzon provinces of Bulacan and Bataan. Maria Luisa Camagay´s study even documented tobacco workers from the Visayan islands, a proof that the heightened industrialization and urbanization in Manila encouraged internal migration at the time.[37] Most of these urban workers from the provinces stayed in cramped boarding houses or rooms for rent near the factories which posed health and hygiene threats.

The district was home to the native urban lower-income population group in the city with their dwellings made of light construction materials. In 1865, a fire swept almost the entire suburb of Tondo which left thousands of households homeless. After the fire, colonial governments promulgated decrees and implemented measures in reconfiguring this lowly settlement. Inundation was also a perennial problem of Tondo which posed persistent threats to the settlement´s salubrity. Tondo had a cemetery of its own which was located near the bay. It was also reported that a match factory was established in this district as well as a modest theatre where Tagalog productions were held.[38]

[37] Maria Luisa T. Camagay, ¨A Look into the Working Filipina during the 19th Century: The Cigarreras of Manila¨ *Archipel* 31 (Anne 1986), p. 181. See also: Camagay, *Working Women of Manila in the 19th Century,* University of the Philippines Press and the University Center for Women Studies, 1995.
[38] González Fernández*,*, p. 84

Sampaloc

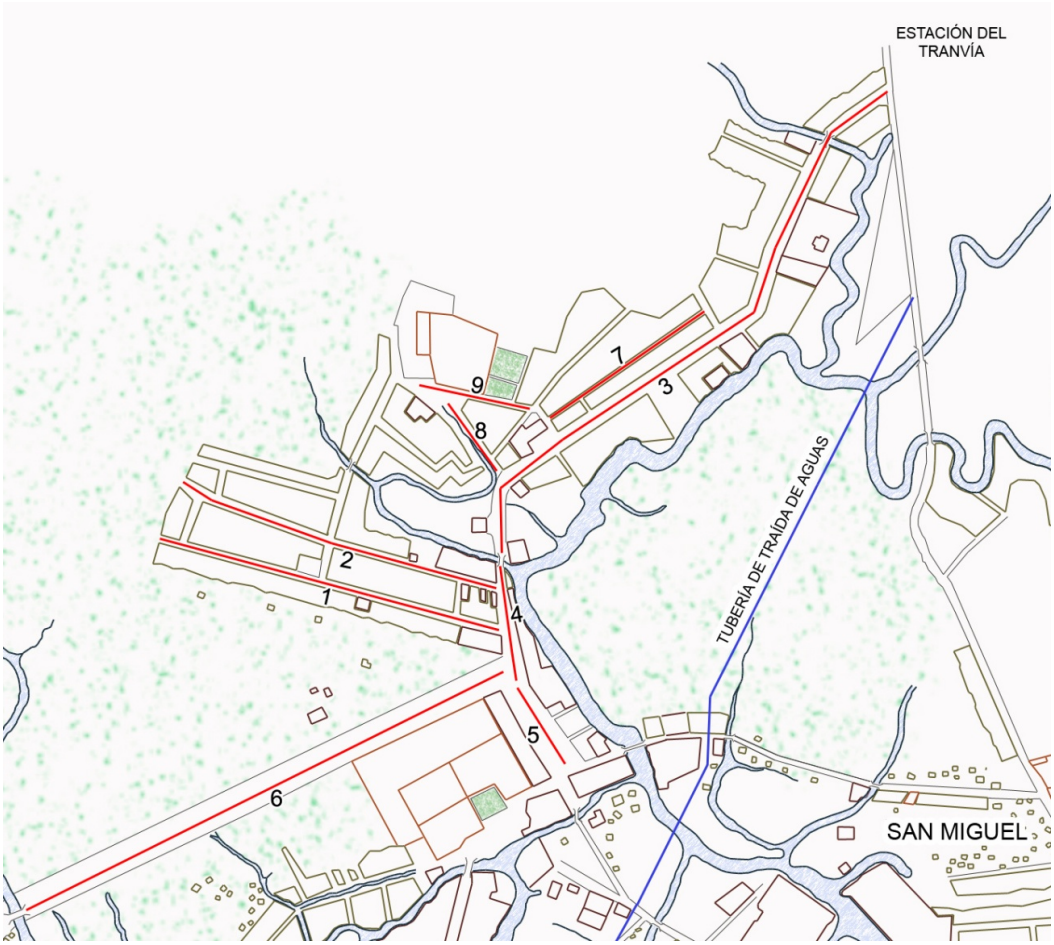


Figure 10: A reconstructed map of Sampaloc showing the named streets of the suburb in the last years of the nineteenth century
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (*Plano de Manila y sus arrabales, 1898*)

LEGEND

1 – Lardizábal	2 – General Castaño	3 – Alix	4 – San Antón
5 – Santa Ana	6 – Calzada Iris	7 – Lavanderos	8 – Manriolo
9 – Real / Bustillos			

The suburb of Sampaloc was almost two kilometres away from its contiguous suburb of San Miguel. It was a traditional settlement for the natives which was reflected in the houses made of nipa and other light construction materials. Most of the residents in the barrio were laundry women, clothes pressers, and workers in printing press. In fact, Sampaloc was home to many printing press in the nineteenth century. It had its own church and cemetery.[39]

[39] González Fernández (1875), pp- 82-83.

Trozo, while technically considered an arrabal that comprised the city, lacked the vibrancy of the other suburbs. The 1865 fire that hit Trozo almost eradicated its entire dwellings and structures which left thousands of natives homeless.

Paco, Ermita, Malate: The suburbs on the left bank of the river

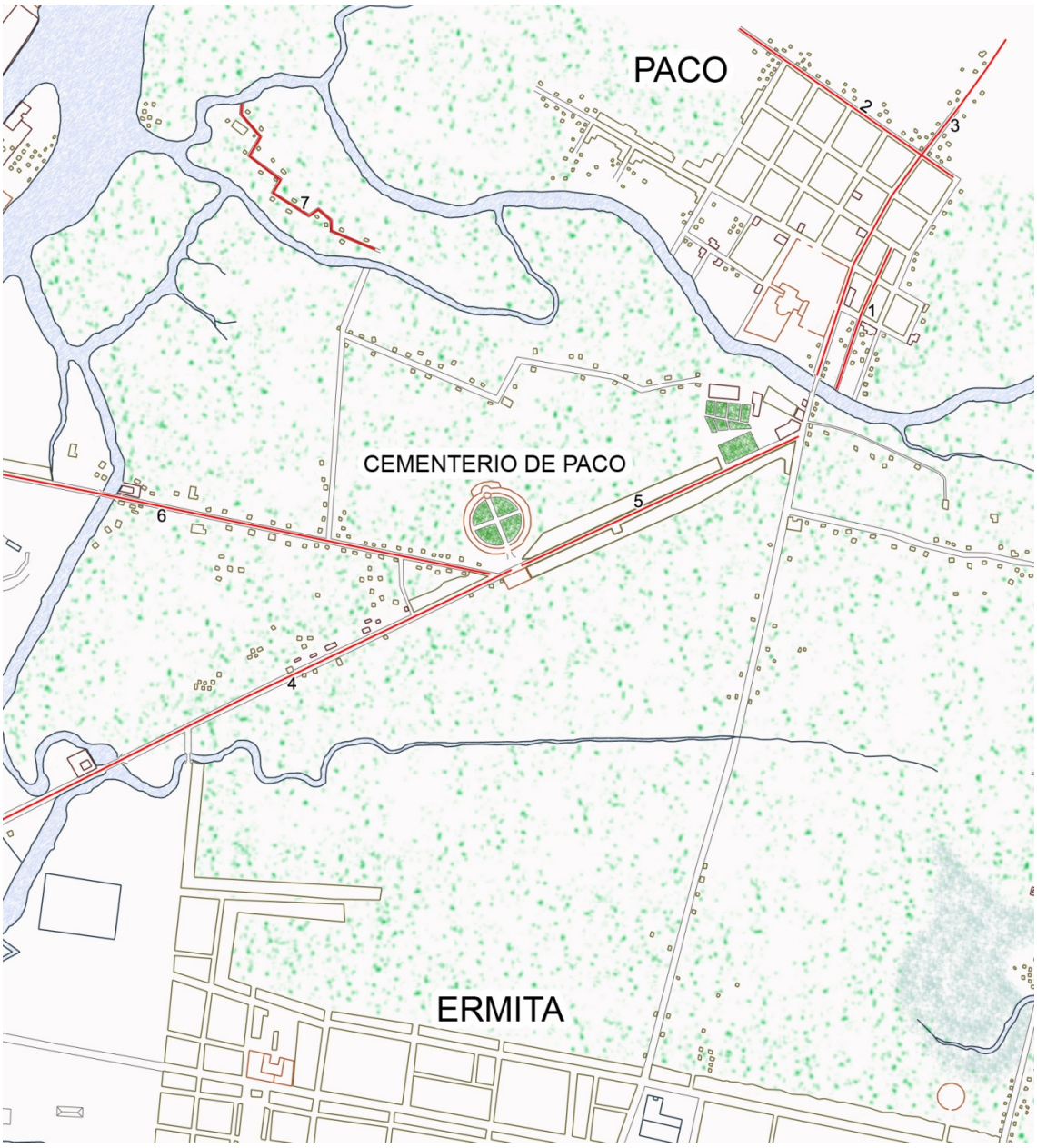


Figure 11a: A reconstructed map of Paco/San Fernando de Dilao showing the named streets of the suburb in the middle to the last quarter of the nineteenth century[40]
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (*Plano de Manila y sus arrabales, 1898*)

[40] In the mid-nineteenth to the last quarter of the century, the only decipherable streets in maps were Aceiteros, Pescadores (which became part of Santo Cristo in Binondo), Bulbao, Ilaya, Quesada, and San Maria. See Map 8.

LEGEND

1 – Santiago	2 – Peñafrancia	3 – Santa Ana / Real	4 – Calzada de
5 – Nueva	6 – San Marcelino	7 – Tanque	

Figure 11b: A reconstructed map of Paco/San Fernando de Dilao showing the named streets of the suburb in the last years of the nineteenth century.

LEGEND

1 – Peñafrancia	2 – Real	3 – San José	4 – San Antonio
5 – Perdigón	6 – Sepulcro	7 – Santiago	8 – Sagal
9 – Paz	10 – Merced	11 – Nueva	12 – Calzada de Paco
13 – González	14 – Canónigo	15 – Laoban	

(Note the difference of Paco´s expansion in these two maps)

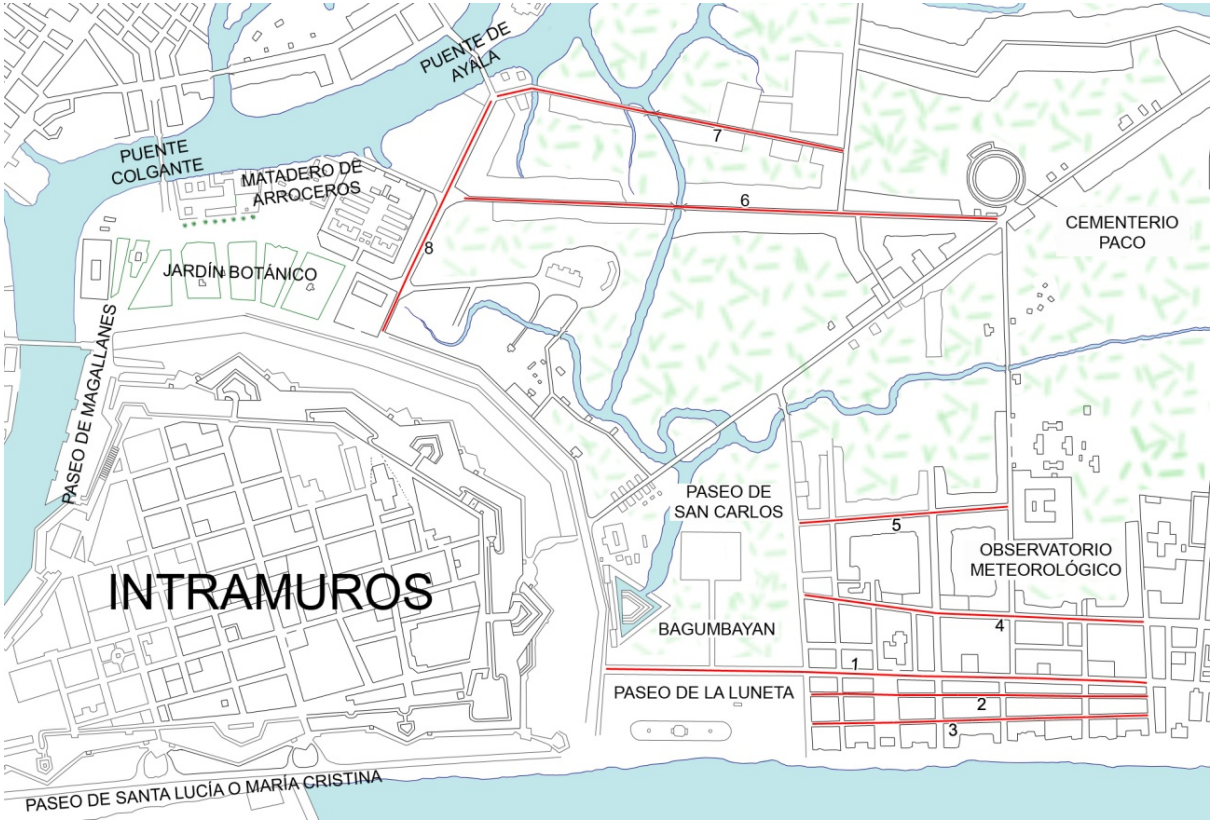


Figure 12: A reconstructed map of Ermita showing the named streets of the suburb in the last years of the nineteenth century
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (*Plano de Manila y sus arrabales, 1898*)

LEGEND

1 – Real	2 – Marina	3 – San José	4 – Nueva
5 – San Antonio	6 – San Marcelino	7 – Marqués de Comillas	8 – Concepción

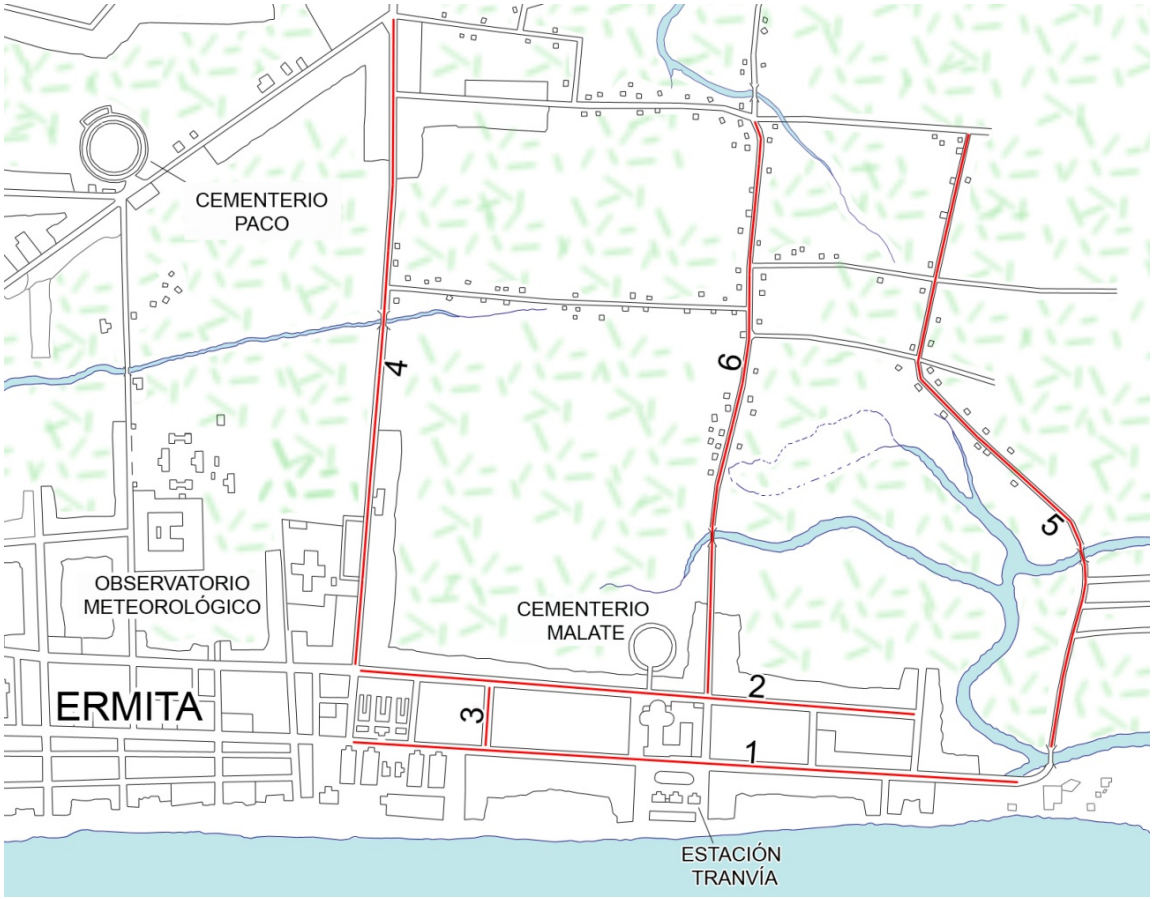


Figure 13: A reconstructed map of Malate showing the named streets of the suburb in the last years of the nineteenth century.
Source: Costelo, 2020. Elaborated by using the data from maps and published accounts during the period (*Plano de Manila y sus arrabales, 1898*)

LEGEND

1 – Real 2 – Nueva 3 – Remedios 4 – Calzada de Herrán
5 – Calzada de Ligero 6 – Calzada de San Andrés

The suburbs to the left side of the bank for the most nineteenth century were significantly less-populated with very scarce structures of importance. This was reflected in the earlier maps of the city which showed bare lands and scattered settlements of natives made of light construction materials. These lands were indeed viewed as the city´s frontiers.

Of the three, the suburb of San Fernando de Dilao/Paco was given emphasis the most because of the presence of the city´s general cemetery in the area. By the mid-nineteenth century, a growing number of dwellers would be observed in Paco as poor urban natives underwent exodus from the right to the left side of the river bank. This was primarily caused by the tightening colonial policies on house construction on the right side of the river to arrest the suburbs´ exponential agglomeration.

Ermita was the suburb closest to the fortified city of Intramuros. The Arroceros district, which pertained to Ermita, could be considered a nineteenth-century ¨*factory zone*¨ due to the presence of two tobacco factories in the area which cumulatively employed more than 10,000 workers. The military hospital and the new city slaughterhouse were also located within the vicinity. Meanwhile the Concepcion district of Ermita served as the residential area of the suburb with a road connecting Manila to the nearby province of Cavite. In the last decades of Spanish rule, the modernizing Meteorological Observatory of the Jesuits was established in this suburb.[41]

Malate, the suburb adjacent to Ermita was separated from the latter by Laguio Street. Like Ermita, its principal roads led to the province of Cavite. In the last quarter of the nineteenth century, it had only two primary streets: Real and Nueva. Although it still had a few named streets at the time, the establishment of a *tranvía* station in Malate would suggest not only the expansion of the suburb but also of its progressive incorporation to the municipal territory of Manila. The suburb was site to military barracks and munitions dump, a salt mine (*salinas*) which did not turn out to be profitable, and a cemetery.[42]

In terms of demographic progress, Francis Gealogo notes that Manila´s population data in the nineteenth century demonstrated the emergence of ¨uneven population centers in the suburbs¨ with the suburbs on the right bank of the river (specifically Tondo and Binondo) registering higher birth rate compared to that of Paco and Ermita.[43] Having said this, a process of asymmetrical expansion could also be observed on the suburb´s built environment at the time.

[41] González Fernández (1875), p. 84.
[42] Ibid., 85
[43] Francis Gealogo, (September 2011), p. 410.

B. The Ayuntamiento de Manila: The city council and the colonial built environment

An understanding of the structure and composition of the city council is an indispensable tool in the discussion of the public works projects in Manila. This part relies heavily on the established works of historians Inmaculada Alva, Francisco Hidalgo Nuchera, Xavier Huetz de Lemps, and Ruth de Llobet in order to provide a quick and general overview of the structure and composition of the Manila city council in the late eighteenth to the nineteenth century.

The structure and power of the city council (*cabildo secular*) in Manila differed through time. In the sixteenth and seventeenth centuries, the city council was composed of councilors (*regidores*), bailiff (*alguacil mayor*), scribe (*escribano mayor*), (*depositario general*), (*castellano de Santiago*), and (*provincial de la Hermandad*). However, these positions were not all always filled in and occupied. Their numbers also varied depending on the necessity of the time and the will of the Spanish crown. At first, the fixed number of the council consisted of two mayors (*alcaldes ordinarios*), twelve councilors, one bailiff, and one scribe but these numbers were never always followed due to insufficiency of appointed men.[44]

The core of the city council is the *regimiento,* or the assembly of all councilors which stood as the people´s representative as they were regarded as the intermediaries of the Crown and of the general public. The councilors were privileged Spanish *peninsulares* men, individuals who may have had engaged in commerce in the Galleon trade and were appointed by the governor general or had the economic means to purchase the post. The city council was headed by the mayors (*alcaldes ordionarios*). As the colonial capital, Manila was entitled to two mayors. The position was elective in nature as mayors were voted in from the pool of councilors. Their responsibilities also included the presiding of council meetings and the performance of some judicial obligations in the city.[45]

These men who comprised the municipal government were expected to be knowledgeable as affairs of the city normally passed through the council. However, the municipal power of the councilors were mostly only limited to the quotidian matters concerning food supply, prices of products, the distribution of plots, concessions of licenses to sell, and the business of public order, etc..[46] Although in the earlier centuries,

[44] Alva Rodríguez (1997), pp. 152-154.
[45] Ibid.
[46] Ibid., p. 152.

the *cabildo secular* of Manila set forth construction projects, most of these were military and religious in nature. This was affirmed in Inmaculada Alva Rodriguez´study as she categorized the nature of public works expenses into the following: fortification works; construction and repair of government buildings (*casas consistoriales*) such as the ayuntamiento, prison, etc; structures for the city´s provisions namely stores, bakeshops, butcher´s place; religious edifices, convents, and colleges; and a very few urban infrastructures such as bridges, esteros, and roads.[47]

The burgeoning social and economic conditions and the political transformations in the late eighteenth century to the nineteenth century gave birth to a very complex and highly heterogeneous colonial society and to the wielding of political, social, and economic importance of *criollos* (also known as *españoles filipinos* or Spaniards born in the colony), and mestizos in the Philippines especially in Manila. Hidalgo Nuchera presented this expanding political space that the *españoles filipinos* or Spaniards born in the islands began to occupy with the ideological changes brought by the ideologies and policies behind the 1812 Cádiz Constitution and the changing local political realities of the time. He called this period as the emergence of *criollosmo* in the Philippines.[48] De Llobet complements this study and argued that the increasing demand among creoles for greater participation and power in the Manila´s cabildo or municipal government signalled the ¨genesis of the archipelago´s political modernity¨.[49] Influenced by the changing ideas in governance at the time, she claims that these creoles, alongside the native elites and Chinese mestizos, became carriers and articulators of liberal ideas in the colony.

Elizalde theorizes that by the nineteenth century, the Philippine colonial society was marked by increasing permeability and breaking up of rigid political, economic, social, and racial categorizations.[50] While the composition of the Ayuntamiento of Manila remained to be generally dominated by Spanish peninsulars in the nineteenth century, the increasing permeability of this political space was witnessed at the time as shown in the studies led by Elizalde and Huetz de Lemps.[51] Although racial categories were mostly observed in the political world so as to confine the colonial power in the hands of the

[47] Ibid., p. 134
[48] Patricio Hidalgo Nuchera, ¨Constitucionalismo y emergencia del criollismo en las islas Filipinas (1809-1815),¨ *AHDE,* Tomo LXXXVII (2017), pp. 89-121.
[49] De Llobet (2011), p. 4-5.
[50] María Dolores Elizalde, ¨Beyond Racial Divisions and Intersections in the Spanish Colonial Philippines,¨ *Philippine Studies: Historical and Ethnographic Viewpoints,* vol. 67 no.3-4 (2019), p. 343-374.
[51] Elizalde and Huetz de Lemps (eds.), 2017.

peninsulars and to maintain Spanish dominion in the lands, the increasing socio-economic importance of *criollos* or *españoles filipinos* and of the mestizos opened for their bigger participation in the city council. The prosographic study of Huetz de Lemps on the racial, economic, political, and social background of the city councilors and mayors shows that by the nineteenth century, the privileged and highly-exclusive position of being a member of the city council was no longer completely limited to Spanish *peninsulares* such as the cases of Juan José Aguirre and José Montoya, Americans who were elected into the council in the 1810s and 1820s and the curious case of Rafael Yangco, a Chinese mestizo who served in the council from 1894-1897.[52] In terms of profession, the council became diversely composed. Aside from the traditional councilors who were merchants and property owners, there was an increased presence and participation in the council of ¨liberal professionals and intellectuals¨ such as lawyers (e.g. Manuel de Azcárraga, Joaquín Pardo de Tavera), doctors and sanitary professionals (Quintin Meynet, Pablo Nalda), journalists and printers (e.g. José Felipe del Pan, Baltazar Giraudier), industrialists (Francisco Paula de Rodoreda, Manuel Ramírez, Enrique María Barretto) and engineer-architects (i.e.Luciano Oliver[53], Antonio Ulloa[54]). Moreover, the councilors also held other positions aside from serving as members of the City Council. This was the case of Francisco Paula de Rodoreda who simultaneously served as councilor and inspector of the municipal cemetery from 1879 to 1882.[55] The diversification of the composition of the city council, the heightened involvement of enlightened men, and the multiplied presence of men born and raised in the colony with their own vision of urban life, arguably played an important role in the conceptualization and concretization of modernizing ideas for the improvement of the urban environmental conditions of the capital.

By the nineteenth century, the Ayuntamiento served as an institution of control over the built environment of the city. The crystallization of the municipal power in the formulation of projects and services that would benefit the urban needs characterized the

[52] Xavier Huetz de Lemps (2017), pp. 213-226. A valuable table of the members of the city council was provided by Huetz de Lemps indicating the name, years of service in the Ayuntamiento, ethnicity, and profession.
[53] In the 1860s, he designed the first proposals for the new general cemetery in Manila that would replace the Paco cemetery. He was also involved in some religious constructions and reforms such as the Malate church. See: Pedro Lungo Gutiérrez, ¨Luciano Oliver Manchón y la Reforma de la Iglesia de Malate en 1863¨ in María Dolores Barral Rivadulla et. al. (coor.) *Mirando a Clio. El arte español espejo de su historia: Actas del XVIII Congreso del CEHA* (20-24 septiembre 2010).
[54] Authored the final blueprint for the La Loma cemetery and the new city slaughterhouse in Manila in the last quarter of the nineteenth century.
[55] Huetz de Lemps (2017) p. 186.

time. Urban historian Swyngedouw posits that in a global scale, the epoch was a period of *municipalization* of public works construction which was prompted by concerns over deteriorating environmental concerns and calls for a sanitized city. In urban construction, this period was marked by municipal governments channelling funds, through subsidies from taxes and other revenues, in providing basic necessary services, such as water supply, public lighting, improvement of streets, construction of cemeteries, markets, and slaughterhouses, maintenance of cleanliness and ornate, etc. Swyngedouw adds that this municipalization typically gained strong support from the local elites who ¨realized that their own health and environmental conditions were negatively affected by the deteriorating standards in the city. ¨[56]

By the mid-nineteenth century, the city council of Manila focused its principal attention to the administration of the municipal territory and the urban improvement of the capital. However, Huetz de Lemps was quick to clarify that the councilors´ push for infrastructural reforms and urban services were not always devoid of economic interests. The Ayuntamiento, he adds, ¨was the best source of information concerning new business and investment opportunities especially in public works projects that immensely multiplied in the last decades of the nineteenth century¨. As a matter of fact, the historian notes that some of the most influential merchant groups in Manila made sure that they were represented in the municipal authority like the case of the Ayala-Roxas-Zobel,Balbas-Fernández de Castro, Inchausti-Teús-Elizalde, and Munoz families.[57] In the succeeding pages and chapters, we will see some of these council members engage in public contracts in the public works projects in Manila.

In nineteenth-century colonial Manila, the official correspondences and memoirs of the public works projects reflected the modernizing aspirations of an increasingly liberal city council and a growing urban middle class with strong economic interests while articulating the need to address the rapidly swelling urban problems of an overcrowded city largely populated by natives and Chinese.

[56] Swyngedouw (2004), p. 55.
[57] Huetz de Lemps (2017), p. 188-189.

Chapter 2.

Colonial Public Works: Actors and Colonial Institutions

During the first half of Spanish rule, colonial structures, including the foundation of towns and erection of defense systems, in the Philippines were in the hands of friars who were aided by local carpenters (*maestrillos*) or by colonial military officials. While the friars were primarily concerned with religious architecture, the projects of the military officials were mostly limited at first to defense infrastructures. Lourdes Díaz-Trechuelo´s seminal study demonstrated that the architectural development in the Philippines from the sixteenth to the eighteen centuries were primarily characterized into two: first, the defense and fortification measures that were executed by the past captain generals and eventually by the military engineers as a response to the impending threat of foreign or piratical attacks in the capital and coastal towns and second, the religious architecture of churches, convents, *beaterios,* and hospices carried out by the clerics and different religious orders in the colony.[1]

Beginning in the late eighteenth century, specialized technical institutions emerged. By this time, military engineers were at the forefront in State-sponsored infrastructure projects. By the mid-nineteenth century, the arrival of a new breed of civil engineers (*ingenieros de caminos*) in the colony brought significant transformations in the carrying out of public works projects in the Philippines and in Manila.

A. The Cuerpo de Ingenieros and the military engineers

The military engineers started to arrive in the Philippines with the creation of the Corps of engineers or *Cuerpo de Ingenieros* in the eighteenth century.[2] In Spain, it was only in 1711 that a special corps of engineers was organized. According to Diaz-Trechuelo, the adaptation of the same institution in the Philippines arguably transformed the state of military architecture in the colony which was previously characterized by isolated, fragmentary, and uncomprehensive construction projects.[3]

[1] Lourdes Díaz-Trechuelo (1959), pp. 69-70.
[2] Ibid., pp. 66-67.
[3] Ibid., pp. 69-70.

With the coming of military engineers in the colony, they became the new technicians who drew up the construction plans and monitored their execution. Two of the early known military engineers that were sent to the Philippines were Juan de Ciscara y Ramírez who arrived in the colony in 1705 and authored the fortifications of Cavite, Iloilo, and Fort Santiago in Manila and Tomás Castro y Andrade in 1732 who authored the defense plans for Mindanao and Visayas. After the British invasions in 1762 to 1764, the colonial government through its military engineers and adjutants assigned in the Philippines such as Miguel Antonio Gómez, Feliciano Márquez y Trujillo, Dionisio O´Kelly y Burke, Bartolomé Reynaud, Pedro Cortés, José Belestá y Pared, Tomás Sanz, and Gregorio Claverio focused on improving the defense stronghold of Manila, Cavite, and the principal ports.

These projects resulted to the conception of several maps and plans of the colony most especially of the capital.[4] Through these military engineers, the city was increasingly represented in cartographic form. For instance, military engineers Tomás Sanz and Dionisio O´Kelly authored several Manila blueprints which gave a glimpse of the development and transformation not only of Intramuros but also of the surrounding suburbs and towns in the last decades of the eighteenth century to the early nineteenth century. Although the principal focus of these plans were the proposed or on-going royal and military works in Manila and the state and extent of defense constructions, the maps also reflected the city´s existing urban lay out and its topographical conditions at the time. The blueprints also showed the changes to the capital´s configuration caused by the demolition or prohibition of some barrios and settlements which were implemented to address its security issues. Indeed, these detailed maps and plans were essential part of the colonizer´s project of knowing the colony and its subjects.

While these specialized men were particularly focused on the military and defense constructions in the colony, the first public works projects however were carried out through the assistance of their technological know-how. For example, Gov. Gen. Rafael María de Aguilar sought the service of military engineer Gregorio Claverío in the implementation of Manila´s street works projects in the last decades of the eighteenth century.[5] From this time up to the mid-nineteenth century, the colonial government heavily depended on the technical services of the military engineers in carrying out construction projects in the Philippines. Towards the nineteenth century, the military

[4] Ibid., pp. 70-94.
[5] Ibid., pp. 93-94.

engineers became more involved in the non-military construction projects in the colony. For instance, the new urban lay out for the barrio of San Nicolás in 1863 was authored by the military engineer Esteban Peñarrubia. (This will be further discussed in Chapter 2.) The increasing need and demand for public infrastructures coupled with the insufficiency of personnel gave way to the increased participation of military engineers in colonial public works provided that they were separated from military service or if they were commissioned in the construction projects with consent from their superintendents.[6]

B. The Junta de Obras Públicas and Dirección de Obras Públicas de Filipinas

In the mid-nineteenth century, the colonial government in the Philippines took steps to finally institute an organism that would be responsible for the civil public works in Manila. The Public Works Council or the *Junta de Obras Públicas* (JOP) was established through a decree by Gov. Gen. Manuel Crespo (1854-1856) on 24 March 1855.[7] This was the same time when other institutional reforms were also introduced with the creation of the *Inspección General de Montes* on 23 March 1855 and the *Comisión de Instrucción Primaria* on 7 February 1855. However, it seems that an institution of the same name already existed even before Crespo´s decree as documented by the Guía de Forasteros de Filipinas in 1851, 1852, and 1853.

The Council had a very specific task. It was assigned to undertake improvement projects on the construction of houses in the capital. The plan consisted of replacing the native settlements made of light materials (*nipa y caña*) with strong construction materials. [8] This policy became a perennial problem for the colonizers and the colonized as it revealed multiple layers of problems and challenges for the city and its administrators and subjects. In the succeeding pages, we will see how these measures resulted to other sanitation and zoning troubles for the capital. Temporary commissions were created under the Council to realize specific construction projects. For instance, a commission was formed for the improvement of the streets in Quiapo. (*Comisión de arreglo de las calles en Quiapo*) composed of the *alcalde mayor* of the Province of Tondo who served as president of the commission and several representatives composed of the director of

[6] AHN, Ultramar, 572. Exp.1. ¨ Expediente general de organización del servicio de Obras Públicas de Filipinas: Primer extracto. Organización de la Inspección General. División del Archipiélago en distritos para el servicio de Obras Públicas¨ 1866-1867.
[7] Piqueras Villaldea (2002), p. 242.
[8] Montero y Vidal, tomo III, p. 244.

public works for the Province of Tondo, Emilio Díaz (military engineer), Antonio Ayala, Fernando Aguirre, and Prudencio Santos.[9]

During Gov. Gen. Norzagaray´s administration (1857-1860), the *Junta de Obras Públicas* was reorganized through a decree on 13 February 1858. More polical and economic representatives from the central government and the city council were appointed to its administrative board.[10] With the restructured Junta, Norzagaray assigned the military engineers to lead the public works projects consisting of the new layout of streets and barrios, reorganization of the native´s construction of houses, the planting of trees, and beautification of streets and public spaces of the arrabales and towns in Manila. Through this Junta, Arroceros which used to be a repugnant sight of the capital underwent reform projects such as road pavement, and the construction of a theatre and a botanical garden (*jardín botánico*) where a wide variety of plants, trees, and flowers were grown. The Bagumbayan road was embellished with gardens and promenades (*paseos*). The central government also commenced the canalization of the Pasig river and the construction of the city´s prison.[11]

An examination of the composition of the *Junta de Obras Públicas* in different periods revealed that, initially, it lacked the involvement of specialized men as its composition was limited to the *alcalde mayor* of the Province of Tondo (president) and the parish priests of the suburbs such as Binondo and Sta. Cruz. After the 1855 Crespo decree, the Council was transformed into a more specialized institution composed of military engineers and architects, lawyer, merchants, and political and religious officials. It also introduced a more organized operationalization of projects by forming three commissions that supervised the public works in three different districts of the city. These commissions oversaw measures involving the improvement of the urban lay out and the improvement of streets and public spaces.[12] Finally, the 1858 reorganization decree intended to blend the techno-scientific demands of the public works projects to the political, economic, and religious interests and considerations of the central colonial government and the city council. It is important to highlight the incorporation of representatives from the public Treasury and Audit as well as from like the Banco de Isabel II, Real Sociedad Económica. These developments and transitions could be

[9] *Guía de Forasteros en las Islas Filipinas para el año de 1858.*
[10] Montero y Vidal, tomo III, p. 258.
[11] Ibid., pp. 260-261.
[12] *Guía de Forasteros en las Islas Filipinas para el año de 185*6, pp. 115-116.

reflected in the table below which shows the evolving structure of the Junta de Obras Públicas as an institution.

Composition of the *Junta de Obras Públicas* before its official creation in 1855	**Composition of the *Junta de Obras Públicas* as decreed on 23 March 1855**	**Composition of the *Junta de Obras Públicas* after its reorganization on 13 February 1858**
Mayor of the Province of Tondo (president) One appointed member Parish priests of the suburbs (e.g. Binondo, Santa Cruz)	Ramón Montero Second corporal of the islands (president) Tomás Balbás y Castro (treasurer) Blas Ginar (accountant) Fr. Pedro Peláez (secretary) Military engineers and architects Emilio Díaz[13], Nicolás Valdés[14], Francisco Ulloa Three commissions tasked to oversee the public works projects in the capital: 1. Prudencio Santos (businessman), José Bosch (businessman), and Vicente Carranceja (businessman and ship owner) assigned in the projects in Binondo suburb); 2. Francisco Lecaroz and Antonio Ayala (businessman)- projects in San Miguel suburb; 3. Manuel Peralta and Fernando de las Cagigas (abogado)- projects in Tondo	Second corporal of the islands (president) Assistant inspector engineer of the *Cuerpo de Ingenieros* (vice president) Fixed delegates composed of military engineers, architects, adjutants, and merchants Matías Vizmanos y Regidor, Diego Jiménez, Tomás Balbás y Castro, Prudencio de Santos, Mariano Tuason Temporary delegates representing the political, economic, and religious officials of the central government and the city government of Manila: Ramon Fernández and Francisco Gutiérrez y Robles (representatives of the religious council or *cabildo eclesiástico*); a representative from the Funds, Taxes, and Community or *Propios y Arbitrios y Cajas de Comunidad*; Modesto Poladura (accountant of the government); Claudio Menchacatorre (representative of the city council); Rafael Fernández de Castro (representative of

[13] A military engineer who also served as the architect of the Superior Government in the Philippines, previously appointed as director of public works for the province of Tondo.
[14] An official del Cuerpo de Ingenieros and was appointed architect of the city.

		the Council of Commerce or *Junta de Comercio*); Felipe María Gobantes (representative of the Royal Economic Society or the *Real Sociedad Económica*); Juan Francisco Lecaroz (representative of Banco de Isabel II); arquitect of the superior government; architect of the Hacienda Antonio Pardo Pimentel (secretary)

Table 1: The composition of the Junta de Obras Públicas in different periods. *Source:* Costelo, 2020. Elaborated by using the data from the *Guía de Forasteros de Filipinas* for the years 1851, 1852, 1853, 1856, 1860, 1861, and 1863.

These institutional reforms in Manila´s public works construction came hand in hand with the Civil Superior Government´s (*Gobierno Superior Civil*) attempts to establish a Public Works General Authority or *Dirección General de Obras Públicas*. On 19 September 1844, Gov. Gen. Narciso Clavería wrote a letter to Madrid on the need to create a body that would centralize all the necessary public works projects in the archipelago justifying that ¨the state of increasing prosperity and rapid growth in population¨ in the islands necessitated an improvement in its infrastructures.[15] He added that the insufficiency of techno-scientific experts resulted to weak, imprecise, and disproportionate roads, buildings, and structures that could not resist the perennial strong typhoons and earthquakes. Citing the case of the Spanish Carribean territory of Puerto Rico where two civil engineers were sent in 1841, Clavería appealed for the appointment of civil engineers (then called *ingenieros de caminos*) that would draw topographic plans, design, and supervise the public works projects in the Philippine islands.

[15] AHN, Ultramar, 442, Exp. 4, Expediente general de Obras Públicas de Filipinas: Creación de la Dirección de Obras Públicas y reorganización del ramo, 1844-1865.

Aside from the shortage of military engineers, the varying technical expertise necessary to address the changing needs of the archipelago and the urbanizing cities of Manila, Iloilo, Cebu, and the other developing port cities highlighted the pressing lack of civil engineers in the Philippines. Unfortunately, the request was denied by Madrid citing the reports made by the *Dirección General de Caminos, Canales y Puertos* and by the *Ministro de Hacienda* on 3 December 1845 and 16 March 1846 respectively. The first argued that there was also a shortage of engineers in the peninsula amidst the increase in the number of public works in the metropolis. The Escuela de Caminos had just reopened in 1834 and the period of Isabellin Spain (1830s-1860s) was said to be the birth of modern techno-scientific endeavours in the peninsula. Meanwhile, the second questioned the source of funds for the new organization due to the still observed unstable treasury of the colony despite its growing economy due to international trade.[16] As a result, the metropolis enforced the heightened involvement of the military engineers to perform the task.

Fifteen years had passed but Spain took no concrete steps with regard this proposition. On 16 February 1859, the colonial government in the Philippines resuscitated the idea and put on writing the structure of the *Dirección de Obras Públicas de Filipinas* which was similar to the ones that already existed in Cuba and Puerto Rico. The organization was to be composed by a director which could be a military or civil engineer, an architect from the Academia de San Fernando, assistants (*ayudantes*), draftsmen (*delineantes*) and clerks (*escribientes*).[17] Its organizational structure did not provide a clear delineation between the civil engineers and military engineers since both could be part of this institution. Archival sources do not shed light on the organism´s exact approval from Madrid but documents reflect that in the first half of the 1860s numerous correspondences between the Philippines and Spain already tackled its composition, regulations, budget, and personnel.

To aid the execution of public works projects in the different parts of the archipelago despite the limited number of engineers, directors and inspectors of public works (*directores y inspectores de las obras*) were instead appointed in Albay, Antique, Batangas, Bohol, Camarines Sur, Capiz, Cavite, Cebu. Ilocos Norte, Ilocos Sur, Iloilo,

[16] In the succeeding parts of this paper, a discussion will be made on the efforts by Clavería to channel funds for infrastructures from the public Treasury.
[17] AHN, Ultramar, 442, Exp. 4, Expediente general de Obras Públicas de Filipinas: Creación de la Dirección de Obras Públicas y reorganización del ramo, 1844-1865.

Negros, Laguna, Leyte, Masbate, Nueva Écija, Pampanga, Pangasinan, Samar, Union, Zamboanga. The presence of one architect, one public works director, and five public works inspectors in Iloilo as well as two directors and seven inspectors in Cebu manifested the increasing infrastructure projects in these Visayan port cities.[18] All these measures, from the creation of the Junta de Obras Públicas to the Dirección de Obras Públicas, were building blocks that pave the way to the creation of the Inspección General de Obras Públicas.

C. The Inspección General de Obras Públicas and the birth of civil engineering in the Philippines

The establishment of the Public Works Bureau or *Inspección General de Obras Públicas* (hereafter, IGOP) by virtue of a royal decree on 1 March 1866 signaled the concretization of decades-long attempts of reorganizing the civil engineering corps and the mechanisms of public works construction in the Philippines. It gave way to an increase in the number of civil engineers arriving in the colony. These civil engineers who were primarily products of a more specialized engineering education in the peninsula began occupying important government positions in Spain and in the colonies several years after the reopening of the Escuela de Caminos, Puertos, y Canales in 1834. In the field of civil engineering in Spain, its institutionalization and specialization commenced in the late eighteenth century and became more pronounced in the next century with the foundation of specialized schools and institutions. A turning point was the creation of the *Inspección General de Caminos y Canales* by a Royal Order on 12 June 1799 and, later on, the establishment of *Estudios de la Inspección de Caminos y Canales* which was eventually called *Escuela de Caminos y Canales* in 1802.[19] The engineers, who were products of these institutions, represented one of the new groups of professional elites born and shaped by specialized and standardized formal education and highly technical training in the context of nineteenth century ideas of Spanish liberalism, civilization, progress, and modernity.[20]

[18] *Guía de Forasteros en las Islas Filipinas para el año de 1858,* Manila: Imp. de los Amigos del País, 1863.
[19] Silva Suárez (ed.) (2007), pp. 130-132.
[20] Darina Martykánova, ¨Por los caminos del progreso. El universo ideológico de los ingenieros de caminos españoles a través de la Revista de Obras Públicas 1853-1899,¨ *Ayer,* No. 68 (2007), pp. 193-194.¨

The birth and reorganization of the IGOP could be situated in the bigger reform agenda of the Spanish empire in the management and control of its colonies. In 1851 and 1867, the Ministry of Development (*Ministerio de Fomento*) and Ministry of the Overseas Territories (*Ministerio de Ultramar*) were created respectively and the reimagining of the administration of the colonies manifested clearly in the creation of institutions that had specific functions. It was in this context that the IGOP in Cuba, the Philippines, and Puerto Rico were created. In the Philippines, the second half of the nineteenth century witnessed a more pronounced and perceptible social engineering towards the path of modernization. This modernization, as discussed in the Introduction of this research, came in different waves and aspects which included the sectors of education, science, engineering, medicine, transport and communication infrastructures, and the reorganization of the political and economic administration, etc. For instance, not only was the aspect of public works modified and restructured, several other bureaus *(inspecciones generales*) involved in colonial science and technology were also formed and revitalized in this period such as the the *Inspección General de Montes* in 1863[21] and the reorganization of *Inspección General de Minas* in 1867 after its earlier conception in 1837[22]. The second half of the nineteenth century also saw the emergence of other modernizing institutions like the *Observatorio Meteorológico* in 1865[23] and the *Servicio de Correos* in 1858.

The IGOP itself defined what comprised public works at the time. These referred to infrastructures, which were for general use such as streets, roads, highways, railways, bridges, lighthouses, and ports. Also included were works involving the use and control of water such as systems of potable water, irrigation, navigation, and sewerage, as well as structures for river channeling, lagoon and swamp desiccation, and land clearance.[24] Public works also encompassed schools, prisons, cemeteries, markets, slaughterhouses, and government buildings. Arguably, the creation of the IGOP marked a new era for

[21] Ma. Florina Orillos-Juan, ¨Inspección General de Montes: Isang Institusyonal na Kasaysayan 1855-1898¨ (MA Thesis, University of the Philippines, 1999).
[22] Isabel Rábano, ¨La minería del carbón en Filipinas durante el siglo XIX: La Inspección General de Minas y los informes de Antonio Hernández Espiera (1853) y César Lasaña Vásquez (1861),¨ *Revista de la Sociedad Geológica de España,* vol. 32, no. 1, (2019), pp. 43-62.
[23] Kerby C. Alvarez, ¨Instrumentation and Institutionalization: Colonial Science and the Observatorio Meteorológico de Manila, 1865-1899,¨ *Philippine Studies Historical and Ethnographical Viewpoints,* vol. 64, no. 3-4 (2016), pp. 385-416.
[24] AHN, Ultramar, 572, Exp.1, Expediente general de organización del servicio de Obras Públicas de Filipinas: Primer extracto. Organización de la Inspección General. División del Archipiélago en distritos para el servicio de Obras Públicas, 1866-1867.

public works projects in the Philippines as infrastructure planning and materialization became increasingly institutionalized, centralized, and standardized.

The royal decree in 1866 was followed by several orders and regulations expounding on IGOP´s constitution, structure, budget, and personnel; the division of the archipelago into districts wherein public works will be consolidated; and the rules organizing the lower workforce of the IGOP composed of assistants or *ayudantes* and foremen or *sobrestantes*. The IGOP after its creation in 1866 remained integrated with the *Dirección General de Administración Civil de* Filipinas until 1874.[25] The public works´ scope involved either the central government, the provinces, or the *ayuntamientos*/municipalities. To aid the IGOP in the administration, consolidation, and supervision of the public works in the archipelago, another royal order was decreed on 6 June 1867. This time, the IGOP was organized into 4 districts: Manila, Vigan, Nueva Caceres, and Cebu. The following table demonstrates the scope of administration of each district.

District of Manila	**District of Vigan**	**District of Nueva Caceres**	**District of Cebu**
Manila, Bataan, Bulacan, Cavite, and Corregidor	Abra, Batanes, Cagayan, Ilocos Norte, Ilocos Sur, Isabela, Nueva Vizcaya, Pampanga, La Union, Zambales, Districts of Benguet, Bontoc, Lepanto, Borac, Rio Saltan, Tarlac and Tiagan	Albay, Balabac, Batangas, Calamianes, Camarines Norte, Camarines Sur, Laguna, Mindoro, Tayabas, and the Districts of Masbate, Morong, Principe as far as Marianas	Cebu, Bohol, Leyte, Samar, Romblon, Iloilo, Capiz, Antique, Negros and the Gobierno Politico Militar de Mindanao comprised of Zambonga, Basilan, Jolo, Balabac, Cotabato, Davao, Surigao, and Misamis

Table 2. Administration of public works in the archipelago during the first years of the establishment of IGOP
Source: AHN, Ultramar, 572[26]

[25] Amaya Sáenz Sanz, ¨Los Ingenieros y las comunicaciones en Filipinas en la segunda mitad del siglo XIX,¨ p. 248 in *Manila, 1571-1898: Occidente en Oriente. Madrid* (1998).

[26] AHN, Ultramar, 572, Exp. 1, Expediente general de organización del servicio de Obras Públicas de Filipinas: Primer extracto. Organización de la Inspección General. División del Archipiélago en distritos para el servicio de Obras Públicas, 1866-1867.

The increasing population, political and socio-economic transformations, and the multi-faceted demands of urbanization and development in the colony highlighted the urgency of appointing more civil engineers in the Philippines. More channels of communication and transportation were needed for the growing domestic and foreign commerce. More infrastructures and civil buildings were needed for the growing number of towns, provincial, and administrative districts. The creation of new towns was exponential in the nineteenth century.[27] In the rapidly urbanizing cities like Manila, problems of sanitation and order needed urgent infrastructural solutions. Given these conditions, the Public Works Consultative Council (*Junta Consultativa de Obras Públicas*) requested to Madrid the reorganization of the IGOP and the sending of more engineers in the colony

> ¨if the country's resources were to be developed, if the growing infrastructures were to be preserved, if the floods that so often ravage the entire provinces were to be studied to prevent the terrifying effects of catastrophes, if irrigations were to be initiated in a country that is abundant of non-productive waters, if streets and roads were to be constructed urgently, if the railroad plans by the State were to be prioritized and mapped out immediately to demonstrate to the people the safe and lucrative benefits of the project, and if the coasts were to be illuminated and the ports be marked with beacons, if in a word, these rich provinces were to progress.¨[28]

The organizational reform proposed by the first batch of civil engineers in the Philippines led to IGOP´s streamlining as shown in the table below. This bureaucratic structuring was crucial in the colonial government´s effort to consolidate its public works efforts in a colony that was composed of thousands of islands.

Service and Districts	Jurisdiction	Personnel	Residence
Head Bureau (*Inspección General*)	General service of public works in the Philippines and Marianas	Inspector General (chief)	Manila
Consultative Council (*Junta Consultativa*)		Secretary	

[27] The National Archives of the Philippines *Erecciones de los Pueblos* collection holds rich data on the founding of towns.

[28] AHN, Ultramar, 572, Exp. 2, Expediente general de organización del servicio de Obras Públicas de Filipinas y distribución del personal: Reglamentos de directores de obras locales y de sobrestantes. Escuelas de sobrestantes y de ayudantes de obras públicas. Estados de obras y cuadro de personal, 1867-1879.

Special Commission (*Comisiones Especiales*)	Railway, Ports and Lighthouses, Estudios de ferrocarriles, Hydraulic Studies	1 chief engineer 1 junior engineer 2 assistants	
District of Manila	Manila, Cavite, Bulacan, Corregidor	1 chief engineer 1 junior engineer 4 assistants	Manila
District of Pampanga	Pampanga, Tarlaca, Pangasinan, Zambales, Bataan, Nueva Ecija	1 chief engineer 3 assistants	Manila
District of Ilocos	Ilocos Norte, Ilocos Sur, Abra, La Union	1 engineer 2 assistants	Vigan
District of Cagayan	Nueva Vizacaya, Isabela, Cagayan, Batanes	1 assistant engineer 2 assistants	Ilagan
District of Batangas	Laguna, Morong, Taytay, Batangas, Mindoro	1 chief engineer 2 assistants	Manila
District of Nueva Caceres	Camarines Norte, Camarines Sur, Albay, Masbate, Isla de Ticao, Burias	1 assistant engineer 2 assistants	Nueva Caceres
District of Cebu	Cebu, Bohol, Leyte, Samar, Romblon	1 chief engineer 2 assistants	Cebu
District of Iloilo	Iloilo, Capiz, Antique, Negros, Paragua, Isla de Calamianes	1 assistant engineer 2 assistants	
District of Mindanao	Zamboanga, Basilan, Jolo, Balabac, Cotabato, Davao, Surigao, Misamis	1 chief engineer 2 assistants	Zamboanga

Table 3: Composition of IGOP in 1880
Source: AHN, Ultramar, 572[29]

The colonial government was tasked through the Public Works Advisory Council (*Junta Consultativa de Obras Públicas*) composed of IGOP´s engineers, architects, and technological experts to submit trimestral reports, later, annual reports, on the state of public works in the archipelago subject for general inspection.

Table 4 gives us an idea on the number and nature of projects that the bureau carried out during the last decade of Spanish rule, as extracted from the annual reports for the years 1888 to 1897. These statistics seemed to mirror the projects raised by the *Junta de Consultativa de Obras Públicas* a few years back. It reflects that majority of the works were roads and highways as well as civil constructions. The Educational Act of 1863 that mandated the obligatory basic education of the natives resulted in an increase in the number of school constructions in the archipelago. The period was also characterized by

[29] AHN, Ultramar, 572, Exp. 2, Expediente general de organización del servicio de Obras Públicas de Filipinas y distribución del personal: Reglamentos de directores de obras locales y de sobrestantes. Escuelas de sobrestantes y de ayudantes de obras públicas. Estados de obras y cuadro de personal, 1867-1879.

a significant increase in the construction and reparation of ports and construction of lighthouses reflecting the increased inter-island and international trade during the time. It also presented the unprecedented modernizing projects such as city lighting, the railway and tramway system, and the potable water system undertakings in the colonial capital.

Public Works Projects	**1888**	**1889**	**1890**	**1891**	**1892**	**1894**	**1895**	**1896**	**1897**
General affairs and personnel	5	8	11	6	7	22	10	5	5
Civil constructions	81	70	46	48	72	88	60	48	64
Roads and highways	71	74	67	72	63	34	48	38	44
Railways	10	21	54	32	13	8	3	2	8
Tramway	4	9	6	4	5	7	1	0	0
Ports	12	8	17	24	21	43	33	27	18
Lighthouses	13	16	24	23	27	45	57	57	26
Potable water system	2			3	2				
Various works	6	9	7	7	3	39	48	53	14
Total	205	215	232	219	213	286	260	230	179
Budget in pesos						**1,546,712.06**	**3,439,725.54**	**8,939,909.06**	**1,943,848.85**

Table 4: Summary of public works that the Public Works Consultative Board of the Philippines undertook for the years 1888, 1889, 1890, 1891, 1892, 1894, 1895, 1896, 1897.
Source: Costelo, 2020. Elaborated by using the data from AHN, Ultramar, Exp. 4

The public works projects intended to solve Manila´s urban problems of sanitation and order were included in the bigger public works agenda of the Spanish colonial government during the period. It is undeniable that the waterworks project aimed at providing clean drinking water to the inhabitants of Manila was one of the centerpiece and pioneering works that the colonial government undertook through the IGOP. These projects also included the construction and construction of cemeteries, markets,

slaughterhouses, street lights, dredging of canals and esteros, and the improvement of Manila´s urban street layout.

D. The engineers, architects, and public works reforms

A year after the creation of the IGOP, the *Revista de Obras Públicas*, a Madrid-based magazine that was specifically devoted to engineering, already published the arrival of the first civil engineers (then called *ingenieros de caminos*) in the Philippines. In an 1868 issue, the magazine published the names of Manuel Ramírez Bazán as Inspector General, Casto Olano as Second Chief Engineer and Genaro Palacios, Eduardo López de Navarro and Damián Quero as District Chief Engineers[30]. This batch and the others succeeding them were primarily products of a more specialized engineering education in the peninsula who began occupying important government positions in Spain and in the colonies.

According to Darina Martykánova, in addition to the establishment of specialized engineering schools, academic curricula was complemented with practices, traditions, mechanisms and internal dynamics that would play an important role in molding young professionals in the emerging techno-scientific field in Spain. She further argues that a certain degree of elite consciousness and socio-professional legitimacy developed among students who graduated from French-patterned engineering corps because the selection process they underwent and the curricula, training, and discipline mechanisms they received were considered far more rigid and superior than all other civil servants.[31] In fact, an 1875 article by engineer Rafael Martin in the *Revista de Obras Públicas* would hail the products of these institutions as ¨the sons of Progress and Civilization and the incarnation of the practical spirit of the century¨.[32]

Several Royal Orders[33] clarified the main directives and guidelines concerning the appointment, rights and responsibilities, the length of stay and return to the peninsula of the engineers, assistant engineers, and architects who will serve in the Ultramar.[34] These technology experts could go to overseas territories upon the approval of a formal request

[30] Sáenz Sanz (1998), p. 249.
[31] Darina Martykánova, ¨Shaping a New Man: The Schools for the State Engineers in Nineteenth-Century Spain 1830s–1900,¨ *Engineering Studies,* vol. 6 (2014), p. 87.
[32] Rafael Martin, ¨Cuestión de Vida o Muerte,¨ *Revista de Obras Públicas,* 23 (1875), p. 134 as cited by Martykanova (2007).
[33] Royal Order of 29 September 1877; Real Order of 14 September 1879, Royal Order of 29 January of 1895, Royal Order of 18 June 1897 and Royal Order of 29 September 1897
[34] Baldomero Donnet, ¨Ultramar Las Obras de Públicas en Filipinas,¨ *Revista de Obras Públicas,* año XLV, número 1.199 (15 Sept 1898), p. 453.

for a post or through an appointment granted by the King. At first, Cuba was the most attractive destination for the civil engineers due primarily to the increase in the demand for public works resulting from the intensified economic activity produced by sugar plantations.[35] The Philippines, on the other hand, was at first, the least preferred destination among the Spanish overseas territories because it was considered a relatively untouched geographic and economic frontier. This view would change in the last quarter of the century when the most number of civil engineers in the Ultramar was documented in the Philippines[36] likely attracted by the increased number of public works projects in the archipelago as previously reflected in Table 4.

As previously mentioned, the archipelago was divided into different public works districts. The following table documents the engineers and personnel that comprise the different districts and commissions during IGOP´s early years.

Name	Position	Residence and Assignment
Inspección General		
Manuel Ramírez y Bazán	Inspector General	Manila
Ramón López y Hermosa	First assistant	Manila
Fidel Fernández Anja	Second assistant	Manila
Special Commissions		
Eduardo López Navarro	Second Rank chief engineer (Ingeniero Jefe de 2ª clase)	Manila, assigned to lead the comission on the improvement of the port of Manila, commission on the construction of lighthouses, and the termination of the study on the improvement of navigation in Pasig river and the widening of the rivers in Pangasinan, Pampanga, Nueva Ecija, and Bulacan, supervised the works on the Manila Cathedral
Don José María de Fuentes	Second assistant	
Distrito de Manila		
Gumersindo Canals y García	Chief engineer for the District of Manila	Manila

[35] Fernando Sáenz Ridruejo, ¨Ingenieros de Caminos en Puerto Rico, 1866-1898,¨ *Anuario de Estudios Atlánticos,* número 55 (2009), p. 311.
[36] Ibid., p. 316.

Pedro Otebot	Assistant	Manila, assigned to lead the works on the construction of bridges between the Pasig river and the Convalescence Island
Fernando Martín	Foreman	Manila, staff
José Nuguera	Foreman	Bataan, assigned to study and draft the *casa de gobierno de Manila*
Mateo Valencia	Third assistant	Manila, staff
Antonio Matías y Ortiz	Fourth assistant	Cavite, assigned to lead the bridge construction projects in Bacoor, Calibuyo and Obispo river
Distrito de Vigan		
Genero Palacios y Guerra	Chief engineer for the District of Vigan	Manila; later commissioned in the waterworks projects of Manila and as temporary project lead in the port improvement project of Manila
Luis Martínez Mescas	Major assistant	Cagayan, assigned to lead the reconstruction project of the tobacco warehouse in Carog, the prison and military quarters in Tuguegarao
Don Justiniano Rodríguez,	First assistant	La Union, assigned in the reparation of the *casa de gobierno*
Don Felipe Vara	Third assistant	Zambales, assigned in the construction of the prison and the *casa de gobierno*
Don José Fernández Álvarez	Foreman	Manila, staff of the chief engineer
Distrito de Nueva Cáceres		
Don Vicente Ruiz y Martín	Chief engineer for the District of Nueva Cáceres	Manila
Don Federico Caballero	Third assistant	Albay, appointed to lead the construction of administrative buildings, prison, and the bridge in Gunobatan
Don Antonio López Martín,	Third assistant	Batangas, tasked to undertake the public works projects in Tanauan, San Pablo, San José
Don Juan del Espíritu Santo	Foreman	Sent to Laguna for the reparation of the court (casa tribunal)
Don Ramón Robles	Foreman	Batangas, a servicio de López Martin
Distrito de Cebú		
Don Damián Guero y Díaz	Chief engineer for the District of Cebu	Iloilo

Don Juan Ortoneda y Pedret,	Third assistant	Cebu, assigned to oversee the construction of town halls, public prisons, and the lighting of the ports in the Visayas
Don Benito Rodríguez	assistant	Iloilo, assigned to oversee the public works projects in Iloilo
Don Estanislao Manuel y Martínez	foreman	Iloilo
Table 5: Composition of the Inspección General de Obras Públicas, 1874 *Source:* AHN, Ultramar, 572[37]		

Most of these engineers had to travel to different islands in the Philippines to oversee the public works projects. Like other colonial officials and religious missionaries, they would complain about the harsh tropical climate. Illness was the primary cause of death among the engineers in the Philippines and one of the oft-cited reasons for leaving the colony. The engineers who served as first engineers and second engineers received high salaries and allowances ranging from 10,000-12,000 escudos annually, the lower-ranking officials or assistant engineers in the IGOP (*ayudantes de obras públicas*) and the foremen or site overseers (*sobresantes*) received 1,000 to 2,000 escudos, the draftsmen and clerks got 400 to 600 escudos, and lastly the laborers (*porteros y faginantes*) received 400 to 200 escudos.[38]

While engineers were commonly designated to a particular district, some of them were also assigned to major public works projects especially in Manila. Those who spearheaded the major infrastructure tasks were eventually considered as the most important engineers in the second half of the nineteenth century. It can be argued that Genario Palacios, Eduardo López de Navarro, Casto Olano Irízar, and Manuel Ramírez Bazán were some of the most well-known civil engineers in the archipelago at the time because of their role in some of the biggest and innovative public works projects in Manila.[39] Palacios, for example, was appointed as Second chief engineer on 21 November 1866. He left Marseilles for the Philippines on 19, December 1866 and upon his arrival in the country, he was appointed as the Chief of Public Works in the District of Vigan. Apart from this post, he became a central figure in the planning and execution of the first

[37] AHN, Ultramar, 572, Exp. 2, Expediente general de organización del servicio de Obras Públicas de Filipinas y distribución del personal: Reglamentos de directores de obras locales y de sobrestantes. Escuelas de sobrestantes y de ayudantes de obras públicas. Estados de obras y cuadro de personal¨1867-1879.
[38] AHN, Ultramar, 572, Exp. 1, Expediente general de organización del servicio de Obras Públicas de Filipinas: Primer extracto. Organización de la Inspección General. División del Archipiélago en distritos para el servicio de Obras Públicas, 1866-1867.

[39] Sáenz Sanz (1998), p. 249.

potable water system project in Manila and, later on, the construction of the Nuestra Señora del Carmen Church (San Sebastián Church).[40] A more in-depth discussion of his legacy would be provided on the chapter on the waterworks projects in Manila. For their part, López de Navarro and Olano led the construction and reparation of the major bridges and structures in Manila especially those that were heavily damaged after the great 1863 earthquake. Later, López de Navarro´s contribution to civil engineering in the archipelago would be far tested when he was commissioned to author and provide the technical conditions of the general plan of the railways systems in Luzon, although this massive and revolutionizing public work was financed by British capital. He was also known for introducing a more advanced port engineering in the public works projects in the port of Manila which attempted to utilize new engineering and scientific techniques, modern machines, and the utilization more resistant materials. While the port improvement of Manila integrated the city to a modernizing network of port cities in Asia, the multi-layered bureaucratic limitations between Manila and Madrid and the environmental constrictions brought by the topographic conditions of the bay resulted to the unfulfilled potential of a project that was grand in magnitude and promise.[41] Olano Irízar´ on the other hand was at the helm of the improvement of the port of Manila, the Pasig river, and the esteros as well as the erection of lighthouses in the capital and the coasts of the islands. Meanwhile, Ramírez Bazan´s name and signature became an almost permanent part of all plans and blueprints after the IGOP´s creation owing to his almost two decades' tenure as inspector general from 1866 to 1884.[42]

The engineers and techno-scientific experts as carriers and mediators of modernity

It is undeniable that more than their contributions to the creation of infrastructural projects, the colonial engineers were integral in shaping new ways of thinking about civil

[40] AHN, Ultramar, 477, Exp. 10, ¨Expediente personal del ingeniero de Obras Públicas de Filipinas Genaro Palacios Guerra, 1875-1885.
[41] See the excellent studies of Dídac Cubeiro, ¨Modernizing the Colony: Ports in Colonial Philippines,¨ *World History Connected,* vol. 14, no. 3, 2017 and Xavier Huetz de Lemps, ¨Las Remodelaciones Portuarias de Manila en el Siglo XIX: La Ingeniería Colonial Frente a las Limitaciones Medioambientales,¨ in Elizalde and Huetz de Lemps (2020) in press; Dolores Romero Muñoz, ¨Puertos, Ríos, Canales: La Ingeniería Española en Manila¨ in *Manila, 1571-1898: Occidente en Oriente* (Madrid: Centro de Estudios y Experimentación de Obras Públicas: Centro de Estudios Históricos de Obras Públicas y Urbanismo, D.L. 1998), p. 234.
[42] AHN, Ultramar, 446, Exp. 9, Expediente personal del ingeniero de Caminos de Filipinas Casto Olano Irízar.

engineering and executing public works projects in the colony. Whereas friars and military engineers drew knowledge from their religious and military backgrounds, the civil engineers of the nineteenth century drew from scientific and technical knowledge in order to bring solutions to the persistent problems of sanitation, accessibility, mobility, and order.

Demonstrating a more specialized and technical training from the engineering corps and having wider contacts within the techno-scientific community of the time, they became chief contributors to the modernization project in the latter decades of Spanish colonial rule in the Philippines. Part of these modernization projects were the sanitation infrastructures of clean water, decent sewerage, ordered lighted and salubrious streets, hygienic markets and slaughterhouses, and sanitary cemeteries. In the nineteenth century, the hygienist discourse was integrated in their plans and proposals while employing their techno-scientific knowledge and expertise to address the public hygiene and sanitation issues of urbanizing Manila.

The plans and blueprints that they authored expose a heavy reliance on Western science and technology complemented with local knowledge. This would serve as the basis for pioneering and modernizing public works projects of the first potable water system in Manila authored by Genaro Palacios, the first railways system from Manila to Dagupan by Eduardo López de Navarro, the massive port reconstruction and rehabilitation projects of Manila and Iloilo led by López de Navarro, José García Morón, Alejandro Olano, Diego Álvarez de los Corrales, etc., the sewage systems of key cities, the construction of lighthouses in the archipelago´s coasts and electric lighting in the colonial capital spearheaded by engineers Magín Pers y Pers and Guillermo Brockmann, etc.

Regulations stipulated that engineers who had served six years in the Ultramar could return to the Peninsula, but an extension for three more years was also allowed for those who chose to stay. Interestingly, majority of the engineers working in the colonies stayed or asked for extension beyond their required minimum number of years in the Ultramar. This can be seen in the exceptional cases of engineer Eduardo López de Navarro who had 29 years of service,[43] assistant engineer Felipe Vara Saez who served

[43] Baldomero Donnet and Guillermo Brockman, ¨Muertos Ilustres.¨ *Revista de Obras Públicas,* Año LXVIII número 2336 (1 de julio de 1920), p. 311. López de Navarro would eventually be the President of the *Consejo de Obras Públicas* in Spain in 1907.

for 28 years[44] and engineer Manuel Ramírez Bazán who stayed for 19 years in the Philippines[45]. At least in these cases, these engineers contradict the traditional view that colonial officials assigned in the Philippines did not stay long enough, thus were incapable of grasping the real reforms that the islands necessitated.

Eventually, a network of engineers was formed in the peninsula and the overseas colonies of Spain. Many engineers were assigned to several colonies throughout their careers. José Rius de Llosellas, for example, first served in Puerto Rico for seven seven years before he became part of the corps of engineers in the Philippines.[46] There is also the case of Mariano Cárcer Salamanca who was involved in the early planning of roads and railways in Cuba before he was deployed to the Philippines to study the application of steel in the construction of public works in the archipelago[47]. Such transfers and movements arguably led to the interaction and exchange of a growing number of individuals with technological expertise which undeniably led to wider exposure to various engineering practices. Certainly, these movements created spaces for technological hybridity and knowledge exchange.

While in the Philippines, their role as carriers and mediators of modern ideas and technologies were highlighted while they established contacts with the non-Spanish scientific and engineering experts not only in Manila, Spain, and Europe but also in other colonies such as Saigon, Hong Kong, and Singapore. The IGOP with its new breed of civil engineers were pioneers in the introduction, acquisition, and utilization of emerging techno-scientific knowledge. The engineers may be considered colonial reformers when one year after the establishment of the IGOP in the Philippines, Inspector General Manuel Ramírez Bazán immediately wrote to the Ministry of Ultramar expressing the necessity and urgency of acquiring precision instruments, machines, tools, and supplies to better the colonies´ state of infrastructure. As a result, a Royal Decree on 28 October 1868 authorized the Ministry of Ultramar to have an engineer, then, Engineer José Echevarría, serve as a commissioned agent of the Special Commission for Public Works stationed in Paris to oversee the procurement of materials, equipment, and services for the Philippines,

[44] AHN, Ultramar, 478, Exp. 14, Expediente personal del ayudante de Obras Públicas de Filipinas Felipe Vara Saez, 1869-1894.
[45] AHN, Ultramar, 477, Exp.17, Expediente personal del ingeniero de Obras Públicas de Filipinas Manuel Ramírez Bazán, 1866-1888.
[46] AHN, Ultramar, 574, Exp.1, Expediente personal del ingeniero de Obras Públicas de Filipinas José Rius de Llosellas, 1873-1882.
[47] AHN, Ultramar, 448, Exp.6, Expediente personal del ingeniero de Caminos de Filipinas Mariano de Cárcer Salamanca, 1868-1880. It is however more common for engineers to be transferred from Cuba to Puerto Rico and vice-versa.

Cuba, and Puerto Rico.[48] This Paris-based Special Commission for Public Works, headed by Echevarría and followed by Engineer Enrique Gadea after the former´s death in 1886, took a vital function in the diffusion and circulation of emerging ideas and expertise from the French, British, Belgian, German, and Spanish techno-scientific communities to the Ultramar.

French and British influence and technologies eventually became very much evident in the nineteenth century public works projects in the Philippines. The French influence was naturally apparent in the Spanish colonial engineers since it was through France that the wave of modern techno-scientific knowledge and innovative public works projects was diffused in Spain.[49] On the other hand, Spanish engineers were also strongly influenced by the British model as reflected in Eduardo López de Navarro´s ¨*La India Inglesa*¨. Here he studied how the British´s infrastructure projects, for example, the railway system and the construction of irrigation channels, were carried out in India in order that they may also properly execute the infrastructural projects in the Philippines. Cognizant of the limitations of Spanish technology, he commented that:

> *We* [the Spanish engineers] *cite these examples because they are worthy of imitation and because they reveal the difference in administration and supervision of public works and other services that are exerted in those territories dominated by England, whose careful and intelligent direction has produced the observed progress in its colonies.*[50]

It is therefore unsurprising to see a number of references and comparisons to British and French cities and colonies, aside from Spanish, in the blueprints (*memorias del proyecto*) of these civil engineers. In the succeeding chapters, we will see how in Manila´s streets will be compared to that of Saigon´s streets in the last quarter of the nineteenth century, how the quality of water in Manila´s waterworks fared compared to Spanish, French, British, American, European, and Asian sources of water, how the architectural designs of cemeteries, markets, and slaughterhouses strived to meet the state-of the-art plans in Europe, the Americas or other colonies at the time.

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[48] AHN, Ultramar, 508, Exp. 6, Sobre la compra de los instrumentos útiles necesarios para el establecimiento de Obras Publicas, 1866-1867.

[49] Raymond Carr, *España 1808-2008*, (Barcelona: Ariel, 2009). More than half of the capital for the Spanish railway project was French capital. The French investment in Spain, according to Carr, was 35%. This strong dependency of Spain to France had repercussions in the politico-economic aspect of the Iberian Peninsula.

[50] Eduardo López de Navarro, *La India Inglesa* (Manila: Manila Imprenta del Diario de Manila, 1897), pp. ix-xii. ¨*Citamos estos ejemplos porque son dignos de imitarse, y porque de ellos se deduce de cuan distinta manera se ejerce la administración y la dirección de las obras públicas y de otros servicios en aquellos territorios dominados por Inglaterra, cuya dirección inteligente y cuidadosa ha producido y produce los adelantos observados en sus colonias.* ¨

Apart from machines and instruments, specialized publications on construction were also brought into the colony to broaden an already growing pool of theoretical knowledge possessed by the engineers. On March 1876, the IGOP's Inspector General wrote a request for the acquisition and free shipment of publications such as the ¨*Colección de fotografía de las obras públicas de la Peninsula*¨ and ¨*Monumentos arquitectónicos de España*¨. According to the request, the IGOP needed to study all types of infrastructures and be updated with building technologies in order to fulfill its functions.[51] The engineers´works contributed to the techno-scientific knowledge production about the colony as they published memoirs and special studies in the *Revista de Obras Públicas*, An example would be Manuel Ramírez Bazan´s publication on the *quarry* in Talim Island in Laguna, documenting the natural properties and classification of its rocks, stones, gravel and other construction aggregates, their similarities and differences to the other quarry sites in Morong and Bulacan, and the new technologies and techniques on how to exploit these resources.[52] However, this remained a theoretical knowledge as it was produced during the twilight years of Spanish rule in the islands.

Innovative and modernizing works demanded an unceasing dialogue between the Western techno-scientific knowledge and training of the colonial engineer and the distinct realities of the colony´s local environment. Praising the waterworks proposal authored by Genaro Palacios, the board of engineers who examined the blueprint acclaimed Palacios´ ability to ¨conquer¨ these difficulties:

> *It [Palacios´ proposal] is the only acceptable, the only one that solves the difficult problem of supplying water to Manila in a way that meets the present needs and…[of] those in the future even with a marked increase in population…[T]he proposed solution, which seems so natural and simple today, so aptly conquered all the difficulties so that Manila could be supplied with a water service at par with the best-endowed populations. It could not have been possible without the immense work and physical fatigue…[in] investigating the most suitable and convenient means to overcome the obstacles of a thousand-kind, arising from the topography of the land, the peculiar situation of Manila, and the available means in these remote regions…*[53]

[51] AHN, Ultramar, 508, Exp. 4, Adquisición de un ejemplar de la obra titulada Monumento arquitectónicos de España¨ y de otro la colección de fotografía de las obras públicas de la Península con destino a la biblioteca de la IGOP, 1876.
[52] Manuel Becerra Fernández, ¨Un apunte de las canteras de Talim,¨ *Revista de Obras Públicas,* 44, tomo I (1120): 243-244; (1121): 269-272; (1122): 304-308. Becerra Fernández served as *ingeniero* de Caminos, Canales y Puertos de Filipinas in 1894 until the end of Spanish rule.
[53] AHN, Ultramar, 491, Exp.2, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Sobre un legado dejado para surtir de agua potable a Manila. Proyecto de Genaro Palacios¨ 1859-1869. Informe de la Junta de Obras Públicas, diciembre 1869.

¨Es el único aceptable, el único que resuelva el difícil problema de surtir de aguas a Manila de un modo que satisfaga las necesidades presentes y los que puedan presentarse en lo sucesivo aun suponiendo que la población aumente notablemente su vecindario… La solución propuesta que hoy parece tan natural y sencillo, que tan acertadamente vence todas las dificultades y que proporcionará a Manila la ocasión de colocarse en cuanto a servicio de aguas al lado de la población mejor surtidas, no ha podido obtenerse sino después de un inmenso trabajo en el que las fatigas físicas, por importantes que sean, nada son comparadas con los que sufre el espíritu en la investigación de los medios más adecuados y convenientes para vencer los obstáculos de mil géneros que ofrece la topografía de terreno, la caprichosa situación de Manila, y los medios de que pueda disponerse en estas apartadas regiones.¨

From European to Asian contacts: knowledge transfers and links

Spanish colonial engineers in the Philippines eventually adopted some adjustments and modifications in the process of acquiring machines and equipment for the public works. The habitual delay in manufacture and delivery of modern equipment from Europe to the Philippines on the one hand and the advent of equally-modern and competitive technologies in other colonial capitals such as Hong Kong, Singapore, and Saigon on the other, led the engineers in the Philippines to start acquiring equipment and machinery channeled through the British and French colonial cities in the Asian region. Accessibility, practicality, and proximity were the oft-cited reasons given by the engineers to explain why purchasing machinery in these areas were beneficial to the colonial government. Large heavy equipment acquired in Europe needed to be disassembled to smaller parts before their transport to the Philippines. The engineers in Manila reported that oftentimes, the difficult, meticulous, and tedious process of transporting apparatus usually resulted to the loss and breakage of some parts. The long period of reassembling the parts in Manila also caused delay in construction works.

For example, they cited that ¨although the dredging equipment was constructed faster in Europe than in Hong Kong, the machines had to be dismantled before their transfer, however, setting it up again in this capital would take less than four months therefore it is impossible to hope to have them in service not until mid-1885¨. In the end, the board of engineers in Manila chose to acquire the machines proposed by the Hongkong and Whampoa Dock Company and Limited,[54] considered as the ¨premier dock company¨ in this British protectorate and one of the founders of the modern shipbuilding

[54] AHN, Ultramar, 577, Exp. 5, Aprobación del proyecto de obras de mejora del Puerto de Manila: Presupuestos adicionales para el montaje del nuevo tren de limpia y construcción de almacenes, 1884-1885.

industry in the Asian region in the nineteenth century. [55] The board of engineers in the Philippines would further strengthen this network when the colonial government and the Hong Kong –based company signed an agreement for the latter to build a steam tug *(vapores remolcadores)* to be used in the Manila port projects. It was a difficult process because originally the Lyon-based engineers of Henri Satre won the bid to construct the steam tug however the engineers pressed for the urgency of its acquisition due to the delay of production in Europe. Without these tugboats, the engineers could not begin the transport of stones for the construction of the breakwater in the port of Manila. After evaluating several proposals from Spanish and non-Spanish engineering companies and subsequent exchange of correspondences between the J*unta Consultativa de Obras Públicas* and the Hongkong and Whampoa Dock Company*,* the *Ministerio de Ultramar* in Madrid approved the engineers´ request for acquisition and agreed that ¨it [*Hong Kong manufactured tug*] *is much more advantageous and beneficial than those made in Europe, considering the proximity of that place to those islands, ease of transport and completion of the tugboats in expedient schedule*¨[56].

The circulation of ideas was also evident in the visits of techno-scientific experts and agents by these companies to the Philippines, such as Mr. Guilles of The Hongkong and Whampoa Dock Company. Correspondences and contracts reflected a room for collaboration and engagement between Spanish and non-Spanish techno-scientific experts and constructors.

On the other hand, colonial engineers who spearheaded the construction of the port in Iloilo linked with the Singapore-based Riley Hargreaves and Company in acquiring port equipment and a tug.[57] This company, founded by the British pioneers Richard Riley and William Hargreaves in the mid 19th century in Singapore which eventually merged with engineering firms Howarth Erskine, specialized in iron, brass, and steel structures and was behind some of the modernizing public works and structures in British Singapore.

[55] Steve Tsang, *A Modern History of Hong Kong 1841-1997* (London: I.B. Taurus & Co. Ltd, 2004).
[56] AHN, Ultramar, 577, Exp. 3, Aprobación del proyecto de obras de mejora del Puerto de Manila: Reducción de impuestos. Reorganización del personal de la Junta de Obras del Puerto. Adquisición de remolcadores, 1883-1884.
[57] AHN, Ultramar, 583, Exp. 7, Aprobación del proyecto de mejora del Puerto de Iloílo. Presupuesto general de gastos. Recepción de una draga de rosario, 1896-1897.

Meanwhile, prefabrication, considered a nineteenth century advancement in building technology because it allowed for faster construction, uniformity of design and reduced costs, was also utilized in the Philippines especially in the construction of bridges through the colonial engineers´ linkage with the Gustave Eiffel´s construction company branch in Saigon. Several prefabricated steel bridges following the Eiffel system as proposed by the chief engineer of the District of Batangas, José García Morón, were shipped to the Philippines such as the parts of the 11R and 15r steel bridges of San Cristobal and Santa Cruz in the province of Laguna. Engineers of the Eiffel company, like the Saigon-based civil engineer Francois Schule, went to the Philippines in May 1889 to introduce pioneering building and construction technologies developed by the well-known French construction company. They provided booklets comparing the emerging building techniques in constructing roads, railways, and trams which indicate the easiest way to assemble the sections and the advantages and disadvantages of each technology. The Eiffel company also provided results and certifications as well as photos of several pilot tests and model projects of the company in and outside of France such as the Rach Lang steel bridge in the French-occupied Saigon thus widening the knowledge of colonial engineers in Spanish Philippines,[58] Osaka Iron Works and Shipbuilding, a Japanese engineering company in Japan, also attempted to penetrate the Philippine infrastructure market through its participation in some of the bidding process but it was with the techno-scientific community in Hong Kong, Singapore, and Saigon that the colonial engineers were able to establish stronger networks. In times of natural hazards, such as the 1880 destructive earthquake in Luzon, it was through the colonial engineers' contacts in Hong Kong and Singapore that they were able to immediately procure iron and other construction materials for the reconstruction efforts in Manila and its nearby provinces.[59]

Hybridity in knowledge and technology: local building materials and indigenous techniques

While it is true that there was a heavy influx of Western science and technology in the public works projects spearheaded by the engineers, it should be emphasized however that these ventures were likewise products of the technology experts´

[58] AHN, Ultramar, 488, Exp. 6, Proposiciones de la Casa G. Eiffel para la construcción de dos puentes metálicos para las islas Filipinas, 1889-1894.
[59] AHN, Ultramar, 471, Exp.1, Daños causados en construcciones de Luzón por los terremotos de julio de 1880, 1880-1881.

engagement with the indigenous materials and techniques and local building knowledge. Engineers were excellent surveyors of the colony documenting the rich geospatial information that served as basis for the implementation of the project. An effective plan and project design depends highly on the excellent land survey by engineers and experts. For example, the blueprints of the first potable system project in Manila authored by Genaro Palacios illustrates the complex network of water systems in the colonial capital, its sources and flow, and demographic composition of the urban capital in the second half of the nineteenth century.

A detailed and well-informed survey results to an acquisition of a broader knowledge of indigenous materials, techniques and construction know-how. Most if not all project proposals of engineers indicate the availability and accessibility of local materials in relation to the proposed construction site. Oftentimes, engineers paid much attention to the abundance and wide variety of wood such as *molave, narra, baticulin, dungon, banaba, ipil*, etc. and which species are the most appropriate for specific use. They also relied on indigenous knowledge to determine the wood´s maturity and how to keep them healthy, clean of knots and devoid of holes, sapwood and other defects that could impair their endurance and stability¨[60]. Local building knowledge and technology was appropriated as seen in 1880 when engineer Manuel López Bayo reported that:

> ¨When we started unpacking all the [*imported*] materials for the lighthouse that were stored before the start of the construction, we found some that were eaten by *anay*[61], [including] the pieces of pine wood that serve as supplementary to position the ceilings... Therefore, in advance, we replaced these with pieces of *molave* wood, of the same dimensions and shape but of more endurance type of wood that is incorruptible and impregnable by *anay*. ¨[62]

Wide knowledge of the terrain´s specific features as well as good communication with local residents were very important, therefore during the last quarter of the nineteenth century, the IGOP incorporated natives and mestizos as land surveyors (*agrimensores*), draftsmen (*dibujantes y delineantes*) and appraisers (*tasadores*). An early proposal for the establishment of an *Escuela de Obras Locales* proposed that education and training on matters dealing with mechanics, stonecutting, masonry, construction, and topography be given to aspiring engineers and architects in the colony. Madrid, however,

[60] AHN, Ultramar, 549, Exp.2, Aprobación del proyecto de construcción de un faro en punta de Capones, 1884-1895.
[61] Tagalog word for ¨termite¨.
[62] AHN, Ultramar, 549, Exp.2, Aprobación del proyecto de construcción de un faro en punta de Capones, 1884-1895

cancelled the execution of this plan citing the lack of resources as a primary reason. Instead of a school, an examination system was proposed to produce an auxiliary staff to aid in the development of public works. Those who demonstrated the skill and aptitude were often given the title of assistant (*ayudante*) or foreman (*sobrestante*).[63]

For instance, the table below shows the names of those who either applied or were awarded the post of *ayudante de obras locales* for the year 1888.

Name	Residence	Qualifications and Experience
Vicente Reyes y Francisco	*natural de* Manila	Has a degree in land surveying and land assessment (*agrimensor y perito tasador de tierras*). Has also a degree in commerce (perito mercantil)
Guillermo Gardínez y Cano	*natural de* Iloilo	Has a degree in land assessment (*perito tasador de tierras*). Finished courses in Linear drawing and topography. Has experience as ayudante 3º
Mariano Chanco y Reyes	*natural de* Santa Cruz, provincia de Manila	Finished courses in topography and construction. Applying for the examination for the position ¨ayudantes de obras provinciales y locales¨
Gregorio Mariño	*natural de* Taal, *vecino de* Lemery	Finished courses in topography and construction and linear drawing. dibujo lineal y topográfico; Applying for the examination for the position ¨ayudantes de obras provinciales y locales¨
Eduardo Munarriz	*natural de* Santa Cruz, *vecino de* Binondo	Finished courses in topography and construction. Applying for the examination for the position ¨ayudantes de obras provinciales y locales¨
Marcos Arcenas	*vecino de* Capiz	Has a degree in land surveying and land assessment (*agrimensor y perito tasador de tierras*). Has also a degree in commerce (perito mercantil)

Table 6: Filipinos in the IGOP,1888
Source: Costelo 2020. Elaborated from data collected in AF-BTNT-CCHS-CSIC, Obras Públicas, Microfilm Roll 76612.[64]

Most of these men finished courses in Manila in land surveying (agrimensura) in the University of Santo Tomas or drawing in the *Academia de Dibujo y Pintura* with high

[63] Obras Públicas¨. 1880-1890.

[64] AF-BTNT-CCHS-CSIC, Obras Públicas, Microfilm Roll, 76612.

grades, often *sobresaliente*. In the case of the Philippines, these positions became the entry point for Filipino natives and mestizos in the colonial public works bureaucracy which then led to their training in the field of engineering.

E. Some matters involving the public works: capital, contracts, labor, and corruption

Certainly, the economics of public works projects is a central theme that is connected to the study of colonial public works.. Budget appropriation, so integral in a project's construction, oftentimes reflected the bureaucratic limitations of the colony and the metropolis as well as the perennial problem of revenue and resources. Many times, many urgent construction and repair of infrastructures were shelved due to lack of funds. The availability of funds, the right economic conditions, and the political will to gather and appropriate resources for infrastructure projects always spelled the difference in the materialization of an envisioned public work.

Themes relating to funds and capital, contracts, labor histories, as well as cases of corruption and fraud are deeply-entrenched in the infrastructural projects, more especially in the context of colonial governance. While these themes are not central to this current research, a brief overview might help in providing a more holistic appreciation of the state of colonial public works projects in the Philippines. This overview is also an invitation to more exhaustive and meticulous investigations in the future.

Financing the public works projects

The highly-technical and incisive study of Josep M. Fradera on the state of public Treasury (*Hacienda Pública*) from the introduction of Bourbon reforms in the second half of the eighteenth century to the far-evolving period of the second half of the nineteenth century is indispensable towards a preliminary understanding on how the public works projects were financed in the Philippines. Two fundamental things pertinent to public works capital could be drawn from Fradera´s investigation. First, that in the late eighteenth to the nineteenth century, capital for these types of government endeavors, when possible, were typically extracted from local funds (*fondos locales*) derived from two sources: the community bank or *cajas de comunidad* and the funds from property tax and excise tax (*fondos de propios y arbitrios*). Second, that towards the second half of the nineteenth century, the use of these funds for public works were less discretionary,

conditional, or contingent owing to the specific appropriation of funds for the projects´ realization.

The community bank or *cajas de comunidad (*formerly called *cajas de comunidad de indios)* were funds available for local use of various importance. The funds were derived from collecting an additional tax of one *real* silver aside from the regular tribute exacted from the people. The colonial resource, at first, was frequently used to cover election expenses and stipends of the *gobernadorcillos*, the payment of school teachers, and other local expenditures. The rest was deposited to the Treasury of Manila which would be spent for the other needs of the local government.[65]

The second source of funds were collected from property and excise tax (*fondos de propios y arbitrios*). Funds from property tax (*fondos de propios*), which were usually of insignificant sum, were derived from the leasing of public properties. Meanwhile, funds from excise tax (*fondos de arbitrios*), which generated considerable amount of money, came from the lease or payment of specific public services or activities such as the slaughterhouse lease or public markets lease.[66] For instance, meat from animals butchered in the municipal slaughterhouses intended for public consumption would be taxed as additional revenue for the government. The same was applied to the use of stalls and premises for public vending in markets. Other municipal charges were implemented such as levies on street cleaning and sweeping (*arbitrio de la limpieza y riego de las calles públicas*) or the use of carriages and carromatas on the streets (*arbitrios de carruajes*). In her work, Elizalde cites the complex and multi-layered decision-making processes involved in the administration and management of these impositions and funds underlining the complementary and contrasting viewpoints with regard colonial governance.[67]

In the first half of the nineteenth century, attempts were by made by the colonial government in the Philippines to utilize and channel these funds for the construction or improvement of public works and projects meant for the development of the archipelago. One of the efforts was during Clavería´s administration (1844-1848) when it appealed that the colonial government in the islands be given the authority to make use of these

[65] Josep M. Fradera, *Filipinas, la colonia más peculiar: La hacienda pública en la definición de la política colonial 1762-1868,* Madrid: Consejo Superior de Investigaciones Científicas, 1999, p. 281
[66] Ibid.
[67] Elizalde (2020b).

funds where it deemed necessary- in this case, the development of agriculture, infrastructure, and welfare of the colony.[68]

Most of the public works projects, including the infrastructures for sanitation and order, in the late eighteenth to the nineteenth century were financed from these varied taxation measures and impositions. For instance, in the late eighteenth century, while the principal funds for the construction, illumination, and improvement of streets in Manila were primarily derived from the public Treasury and contributions from the merchants of the *Consulado de Manila,* the insufficiency of funds pushed the central government´s creation of supplementary resources by imposing a form of property tax. The amount of tax (*contribución de la composición y alumbrado de las calles*) to be paid was determined by the measurement of the *façade* of houses wherein each *vara*[69] of property corresponded to a certain sum to be paid by the proprietor.[70] This was the almost the similar case in the construction and reform projects of Manila´s cemeteries, slaughterhouses, markets, and sewages. The costly waterworks project of Manila was a distinct case however. Majority of its funds came, not from taxes but, from a donation (*obras pías*) by Francisco Carriedo, an eighteenth-century colonial official, who envisioned a water system supply for the city´s residents. The funds, which was under the safeguard of the Manila city council, gained investment interest after more than a century. However, these funds still proved to be insufficient due to the project´s grand scale. The city government, with the consent of the superior government, imposed additional meat taxes as supplementary capital.[71]

By the second half of the nineteenth century, relatively clearer fiscal reforms were implemented regarding the financing of public works. These reforms were in line with the establishment of the general rules on the use of government funds by the Treasury Council or the *Junta Directiva de Hacienda* during Norzagaray´s term (1857-1860). In

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[68] Ibid., p. 282.

[69] Unit of measurement used in the Spanish empire. Its measurement differed in distinct regions which ranged from 768 to 912 millimeters.

[70] Archivo General de Indias, Filipinas, 509, R.1, N.6, Duplicado de carta de José de Gardoqui sobre contribución para alumbrado, 1814. Carta del Ayuntamiento constitucional de Manila: Martín de Salaberría, Joaquín Acevedo, Alejo Rodríguez, Mariano Aranda, Juan Blanco Bermúdez, Vicente David, Miguel Sáenz de Vizmanos, Ramón Hurtado de Saracho y Manuel Bermúdez, pidiendo se apruebe la contribución de un real y medio anual por cada vara de frente de los edificios de la ciudad para el alumbrado y limpieza de las calles de Manila. Manila, 28 de julio de 1814.

[71] Francisco de Mas y Otzet, *Carriedo y sus obras: memoria de las obras pías de los pobres y de las aguas instituidas por Don Francisco Carriedo y Peredo y crónica de los festejos que el Ayuntamiento de la Ciudad de Manila ha celebrado para conmemorar la inauguración de la primera fuente de aguas potables* (Manila: Establecimiento Tipográfico de Ramírez y Giraudier, 1882), pp. 60-61.

1859, the Council ordered that 25% of the funds collected from property taxes and excise taxes plus the surcharge funds (the additional tax on top of the regular tribute) of the community bank were to be centralized in the Treasury. According to the new Treasury regulations, these consolidated funds were to be specifically funnelled to the public works ventures that Manila and the entire Philippines would benefit from.[72] These budgetary remedies which explicitly and systematically appropriated funds for the public works projects could be attributed as one of the many factors that changed how infrastructure works were planned, financed, and materialized especially in the second half of the nineteenth century.

According to Fradera, ¨the efforts from governor generals Clavería to Norzagaray to control the local funds were driven by the aspirations which stemmed from the general standard of nineteenth-century liberalism: the centralization of authority and, consequently, the capacity of the General Captaincy to control the public treasury, an orientation that was undoubtedly accentuated by the budgetary constraints with which the top officials were forced to deal with in the islands¨.[73] With these changes, it was undeniable that diversification of expenses was observed compared to that of the previous centuries where appropriations of the public Treasury were mostly limited to the military campaigns and defense works and the remuneration of civil and military officials as well as subsidies to the Church (e.g. stipend of priests and appropriations for the (re)construction of churches, convents, schools, and hospitals).

The Ayuntamiento de Manila emphasized that beginning in the second half of the nineteenth century, two important laws were already passed that clarified the budgetary mechanisms of cities by virtue of the 18 May 1861 royal decree and 26 November 1862 royal order.[74] These laws elucidated and separated what comprised the obligatory and voluntary expenses of cities. The Ayuntamiento de Manila, however, commented that ¨the división [of categories of expenses] was never practiced in the Philippines without knowing the real motive¨ *(la división que no se ve llevada jamás a la práctica en Filipinas sin conocerse el motivo)*. Taking this important fiscal matter on its own hands, the Manila city council categorically stated that:

> ¨inspired by the division [of expenses stated] in the municipal laws of the Peninsula, in addition to what right sense dictates, it follows that obligatory

[72] Fradera, p. 284.
[73] Ibid., p. 284.
[74] Comisión Permanente de Presupuestos del Excelentísimo Ayuntamiento, *Proyecto de Presupuestos Municipales de la Ciudad de Manila para el año de 1892* (Manila: Imprenta y Litografía de Manuel Perez Hijo, 1891), p. 3. These were followed by more laws in the 1870s, 1880s, and 1890s.

> [expenses] refers to everything that constitutes the main mission of the municipal corporations; namely: the administration of the property and rights of the people; the management of ornate, cleanliness and hygiene of the population; the conservation of urban public streets, food supplies, and urban and rural security; and the services of charity, health, and primary education.¨[75]
>
> *inspirada esa división en la ley municipal de la Península, además de lo que dice el buen sentido, se deduce que por obligatorios se estiman los que se refieren a todo aquello que constituye la principal misión de las Corporaciones municipales; a saber: la administración de los bienes y derechos del pueblo; el ornato, limpieza e higiene de la población; la conservación de las vías públicas beneficencia, sanidad e instrucción primaria*

In the official records, it was clear for the municipal administrators of Manila to recognize the importance of laying out public work projects and urban services and the need to improve them. The city council in its general appropriations plan repetitively emphasized the vitality of the city´s ¨*policía urbana*¨- a policy which revolved on the idea of a renewed city and a colonial territory with the essential urban services that prompt salubrity, order, and control. For the city reformers, the total picture of *policía urbana* involved public lighting; cleaning and washing [of streets]; conservation of walks, gardens and parks; construction and reforms of slaughterhouses, markets, cemeteries; supply of clean water; street naming and house numbering; and the extinction of harmful stray animals.[76]

However, behind these urban improvement projects were the unceasing prohibitive taxes imposed on the urban residents, including the poor members of the society. The succeeding chapters would attempt to show how some members of the urban population complained, denounced, resisted, evaded or circumvented these urban services to free themselves from these additional financial burdens.

The question of forced labor

Forced labor or *prestación personal* (more popularly called in the Philppines as *polos y servicios*), a form of tribute in the form of obligatory and uncompensated labor exacted on the native population, is an equally important theme in the study of colonial public works. This policy, prescribed since the early years of Spanish colonial rule and endured until its end in 1898, was the principal mechanism enforced by the government

[75] Ibid., p. 3.
[76] Ibid., pp. 38-40.

for the development of infrastructures and services in the colony. During Gonzalez de Aguilar´s term (1810-1813), the central government enforced the provision requiring the *Indios* to *work in the neighborhood public works.*[77] Corvée was categorized into two: ordinary service and extraordinary service. Public works constructions such as street pavement, road works, construction of buildings, and the dreaded cutting of trees (*cortes de madera*) belonged to the second type.[78]

Through the three centuries of Spanish rule, this policy has been smeared with abusive and exorbitant norms and practices both in the conditions of urban and provincial life. In the nineteenth century, forced labor was one of the main issues of debate and controversy in the context of colonial administration reforms. The issue revolved around the oppression brought by this mandatory system and the low public profitability of this measure as shown in the study of Luis Ángel Sánchez Gómez. He commented that in the context of urban Manila, the *polista* residents of Tondo suffered the worst due to the enormous workload and tasks imposed by the administration of the capital. It also didn´t help that many of these unpaid manual workers were unskilled and lacked the training in infrastructure works.[79]

Sánchez Gómez´s investigation provides a nuanced exposition of the reform efforts on the forced labor policy in the nineteenth century. Although it is widely-known that the *polos y servicios* required men between 16 to 60 years old to render 40 days of unsalaried peons, it is interesting to note that not until 1887 there was no single law or decree on this policy that was applicable to the entire islands. However, the Superior Civil Government in the islands attempted to provide the basic rules and regulations regarding forced labor on 30 October 1837 which established 40 days as the allowed number of days of servitude and the payment of three pesos of those who would seek exemption. To prevent abuses and impose control in the work site, a Corps of Public Works Managers and Inspectors (*Cuerpo de Directores e Inspectores de las Obras Públicas*) was created in the 1860s.[80]

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[77] Montero y Vidal, tomo II, p.401.

[78] Luis Ángel Sánchez Gómez, ¨Los Debates sobre la Regulación de la Prestación Personal en Filipinas durante el Siglo XIX,¨ *Anuario de Estudios Americanos,* tomo LVII, 2 (2000), pp. 581-582.

[79] Ibid.

[80] Ibid., p. 585. Sánchez Gómez in his article documented the issues and debates that characterized the forced labor reforms. Should the policy also include the Spanish and foreign residents in the Philippines? Should the days be changed to from 40 to 24 to 15? Should exemption by made through case or through ¨bonds¨ (*venta de papel*) to prevent abuse? These were some of the questions that were raised in an almost century-long struggle of reforming a policy considered to be detested by many. While it is true that attempts to reforms were introduced, the changes were just too late. Most of the reforms in the colonial laws happened in the 1880s.

Not all the labor pool of the public works projects came from corvée. The government, usually through the contractors, also employed native and Chinese workforce in the construction works. These peons were typically paid on a day to day to basis. By the last quarter of the nineteenth century, the loosening of Chinese immigration rules made way for the arrival of more coolies in Manila.[81] It was said that cheap and organized manpower provided by the Chinese immigrants were preferred by many contractors over the native population. The periodical La Oceanía, which published a series of articles pertaining to the Chinese, criticized this over preference and invoked that the natives ¨by law, are our compatriots and should be given preference than them (Chinese)¨ (*por la ley son nuestros compatriotas y deben ser preferidos a aquellos*.)[82] The newspaper criticized the on-going labor practices. It noted that contractors preferred the Chinese because the former ¨always appeared in organized gangs¨. Therefore, the contractor only had to transact with the leader of the Chinese work gang and many processes could already be evaded. For instance, going through the names of the list of laborers would be unnecessary; payment and work conditions could be negotiated between the contractor and the gang leaders; and less complaints could be expected.[83] The role of the native gobernadorcillo and cabeza de barangay was central in the organization of the work force, the identification of the *polistas* and the execution of hard labor.

However, the lowly Chinese was also typically subjected to harsh working conditions as shown in Jely Galang´s study on Chinese vagrants and undocumented individuals. Many of these social outcasts were sent to prisons and sentenced to forced labor or *forzados.* In the 1860s, the Chinese and native *forzados* in the Bilibid prison were sent to the different public works districts in Manila to serve as additional manpower to the road works and street construction, water works, cemetery construction, and other projects. They were also sent as cleaning brigades tasked to sweep the streets, collect garbage, clean and dredge the esteros and the Pasig river, etc.[84] During times of calamities

[81] Gerard Lico and Mary Delia Tomacruz, ¨Infrastructures of Colonial Modernity Public Works in Manila from the late 19th to the early 20th Centuries,¨ *Journal of Philippine Architecture and Allied Arts,* vol. 6 (2014-2015): 1-25. p.7

[82] *Los Chinos en Filipinas. Males que se experimentan actualmente y peligros de esa creciente inmigración*. *Observaciones, hechos y cifras que se encuentran en artículos que La Oceanía Española periódico de Manila ha dedicado al estudio de este problema social* (Manila: Establecimiento Tipográfico de La Oceanía Española, 1886), p. 31.

[83] Ibid.

[84] Jely Galang, (2019), pp. 260-265. Galang was able to compile a list of names of Chinese *forzados* in the 1860s and 1870s from the National Archives of the Philippines.

and urgent need for manpower, native and Chinese prisoners provided additional hands for the colonial government´s clearing and rehabilitation efforts such as the post-1863 and post-1880 earthquake.[85] In the succeeding chapters, we will see some instances wherein the engineers of the public works projects would specifically state their preference for paid skilled labouerers than the unstable and poorly-trained corvée.

Contracts and concessions

Contracting private individuals or groups in public works projects was already the norm even in the eighteenth century.[86] By the nineteenth century, these contracts would also include the delivery of urban services (e.g. garbage collection, street cleaning, street lighting, etc.) or the supply of construction materials and equipment. With this arrangement, projects could be pursued despite the administration´s insufficiency of personnel, logistics, and budget. By the last quarter of the nineteenth century, this practice was regulated through a new law on 20 April 1877 which controlled the granting of contracts and concessions to private individuals or companies in massive projects such as railways and roads, ports, irrigation channels and navigation, drying of lakes and swamps. and cleaning of unsanitary land while under the supervision, administration, and inspection of the IGOP.[87]

One of the relatively known examples was the building of the outer walls of the General Cemetery in Dilao/Paco, a project approved in 1807 as a response to the imperial-wide policy of erecting burial sites away from the populated settlements, which was granted to Chinese contractor.[88] In the second half of nineteenth-century Manila, it was noted that the ¨majority of the contracts in public markets, stamping of weights and measurements, animal butchering and meat cleaning, crossing of rivers or bridges (*vadeos y portazgo*), and the use of horses and carriages¨ were controlled by Chinese or Chinese

[85] AHN, Ultramar 471, Exp. 1, Daños causados en construcciones de Luzón por los terremotos de julio de 1880, 1880-1881.
[86] For example, a contract was given to Antonio Mazo, a Christian *sangley*, in the construction of the Real Palacio in 1747 and the Junta de Hacienda building in 1750 and to Jerónimo Tongco, *sangley,* in the construction of the the *Seminario Conciliar* in the 1760s. See Lourdes Díaz-Trechuelo (1959).
[87] AHN, Ultramar, 472, Exp. 2, Aplicación a Filipinas de la Instrucción de subastas de obras públicas dictada para la isla de Puerto Rico: Disposiciones sobre adjudicación por contrata y aprobación de la recepción definitiva de las obras públicas, 1876-1897.
[88] Chu and Ang See (2016), p. 90.

mestizo merchants¨.[89] Similar to the issues raised by the periodical *La Oceanía Española* on Chinese laborers, the paper raised not only of the great competition posed by the Chinese to Spanish and native merchants but also of the former´s unfitness to observe the standard rules of good conduct and proper hygiene as ¨they were commonly involved in bothersome, dangerous, and insalubrious industries¨.[90]

In large-scale projects, such as the improvement of the Manila port which included the cleaning and dredging of Manila´s estuaries (*esteros*) and the Pasig river, the plans were divided into several contracts and concessions from construction and manual work, acquisition of modern machines and equipment, to the provisioning of supplies and materials. Most of the machines and supplies, like coal- an indispensable material in the operation of machines and equipment, were imported.[91] From 1880 to 1888, there was a continuous importation of coal from different mining areas in the world to be utilized in the gargantuan infrastructural endeavor. For the year 1888 alone, the *Junta de Obras del Puerto de Manila* reported that payments were made to the following for supplying and transporting this combustible material:

Contractor/ Supplier	**Profile**	**Materials supplied/transported**	**Amount**
Smith Bell & Co.	American firm	For supplying 2 metric tons of coal from Takashima, Japan	11 pesos (50 pesos and 50 cents per ton)
Smith Bell & Co.		For supplying 200 metric tons of coal from Takashima, Japan	1, 400 pesos (7 pesos per ton)
A *cabecilla* (leader of a workgang)	Chinese	For transporting 200 metric tons of coal from Malabon, Philippines	36 pesos (18 cents per ton)
Don Luis Rafael Yangco	Chinese mestizo[92]	For supplying 209 metric tons of coal from Australia	2, 038.20 pesos (9 pesos and 65 cents per ton)

[89] *Los Chinos en Filipinas* (1886), p. 77.
[90] Ibid., p. 130. *¨las industrias incómodas, peligrosas o insalubres a que dedican muchos de ellos¨*.
[91] Coal production did not achieve its great potential despite the various attempts in the nineteenth century. See Rábano (2019), pp. 43-62.
[92] Yangco was a businessman-ship owner and was a member of the Manila city council from 1894 to 1897. In the prosopographic study of the composition of nineteenth-century Ayuntamiento de Manila, Xavier Huetz de Lemps used Yangco´s life history as a case of a Chinese-mestizo who broke the racial-ethnic barriers and penetrated the political-social-economic circle of the city at the time. See Xavier Huetz de Lemps, (2017).

Don Luis Rafael Yangco	Chinese mestizo	For supplying 311 metric tons of coal from Australia	3,039.39 pesos (9 pesos and 65 cents per ton)
Warner Blodgett & Co.	Half-British and Half-American firm	For supplying 1,000 metric tons of coal from Australia	8,250 pesos (8 pesos and 25 cents per ton)
Luis Oraá	Spanish (served as governor of Manila in 1867-1869)[93]	For transporting 401 metric tons of coal to the construction site in Farola	64.16 pesos (16 cents per ton)
Luis Oraá		For transporting 599 metric tons of coal to the construction site in Santa Lucía	119.80 pesos (20 cents per ton)
Warner Blodgett & Co.		For supplying 570 metric tons of coal from Australia	5,415.86 (9 pesos and 50 cents per ton)
Chino José Martinez	Chinese[94]	For transporting 570 metric tons of coal to the Santa Lucía warehouse	102.60 pesos (18 cents per ton)
Rafael Reyes	Insular[95] (*Español Filipino*)	For supplying 200 metric tons of coal from Cardiff	3,200 pesos (16 pesos per ton)
Smith Bell & Co.		For supplying 300 metric tons of coal from Japan	3,000 pesos (10 pesos per ton)

Table 7: List of contractors and suppliers of coal in the Manila port project for the year 1888 as extracted from the *Resumen de las Cuentas de Ingresos y Gastos desde 1880 a 1888*
Source: Costelo, 2020. Elaborated by using the data from *Memorias sobre los actos de la Junta de Obras del Puerto de Manila y el progreso de las mismas obras en el año de 1888*[96]

We can infer from Table 7 that the participation of multiple players and actors in just one of the many aspects of public works. Beyond the usual binary of the Spanish colonizer and colonized native was the presence of diverse population groups composed of Chinese, Chinese mestizos, Spaniards born in the Philippines (*español filipino*), and

[93] AHN, Ultramar, 5201, Exp.31, Expediente de Luis Oraá, gobernador civil de Manila 1867-1869.
[94] The document states that the person is a *Chino*. His name however suggests that he was already a Christianized Chinese.
[95] Huetz De Lemps (2017). According to Huetz de Lemps, Reyes was a businessman-ship owner and was a member of the Manila city council in the years 1889, 1890, and 1892.
[96] Junta de Obras del Puerto de Manila. *Memorias sobre los actos de la Junta de Obras del Puerto de Manila y el progreso de las mismas obras en el año de 1888; Resumen de las cuentas de ingresos y gastos desde 1880 a 1888 inclusivos. Plan de Trabajos. Presupuesto general de gastos para 1889* (Manila: Establecimiento Tipo-Litográfico de Chofre y Compañía, 1890).

foreign trading companies. Indeed, the public works projects could also be examined in what Elizalde refers to as ¨permeable borders¨ in the late nineteenth-century Philippines wherein ¨channels and spaces of interactions and exchanges occurred among the different population groups¨.[97]

Corrruption, fraud, and incompetency in the public works projects

Arguably, public works evoked images of innovation, reform, and colonial modernity. However, from the earliest time to present, public works projects have always been tainted with problems of corruption, fraud, malversation of funds, and cases of dereliction of duty. Xavier Huetz de Lemps in his pioneering study on corruption argued that ¨corruption in Spanish colonial Philipines was not an exception as it was the norm also in Spanish America [and that] it continued to be massive and institutionalized until the end of the nineteenth century. ¨[98] Although, this subject matter is not within the primary scope of this current research, a discussion on the interconnection of corruption and public works could enrich this study. In the meantime, some cases in the public works projects and the actors and institutions involved could provide a fragmentary illustration of this problem and could serve as a beginning of an exhaustive and meticulous study in the future.

Perhaps, one of the well-documented, multi-layered, and high-profile cases was the trial of Juan Rom- architect of the Treasury (*arquitecto de Hacienda*) in the Philippines, Juan de Lara- superintendent of Funds and Taxation (*propios y arbitrios*), and Sixto Ojeda Obispo- contractor, against the allegations of fraud and abuse in the administration of funds in the construction of the Bilibid prison in Manila in the second half of the 1860s.[99] Of the persons involved, Juan Rom was found to be the principal culpable party and was held accountable by the colonial government and the metropolis. Court records showed that Rom was accused of not having built the prison according to the approved plans and of stealing funds for its construction. The case was aggravated by

[97] Elizalde (2019), pp. 344-345.
[98] Xavier Huetz de Lemps, *L´Archipel des Épices. La Corruption de L´Administration Espagnole aux Philippines fin XVIII-fin XIXI siécle* (Madrid: Casa de Velázquez, 2006), p. 28.
[99] AHN, Ultramar, 499, Exp. 2, Aprobación del proyecto de construcción de la nueva cárcel presidio de Bilibid en la provincia de Manila: Protesta del contratista contra las responsabilidades que se le imputan. Expediente instruido por abusos cometidos en la administración de fondos, 1867-1875.

the fact that parts of the penal structure was reported to have collapsed shortly after the building was terminated.[100]

Rom´s defense revolved on the pretext that, first, the Administration failed to properly and meticulously examine the Bilibid prison projects since its inception and planning stage and, second, the inept intrusion of the military engineers caused damages to the project. He argued that ¨the Administration accepted and approved the prison blueprint completely designed by the military engineers despite the errors, omissions, defects, difficulty, contradictions, and problems of the plan¨.[101] He also accused the Administration of meddling in a territory that it has no knowledge of or right to intervene. Rom´s defense also reflected a palpable collision on the nature and ambit of profession between the architects and the military engineers at the time. According to Rom, ¨the prison incident was provoked not by the architect (*him)* but by the military engineers who, because of their role in assisting the authorities and the corporations since time immemorial, have overlapped the tasks and designation of architects¨. He accused them of coming up with a report on 5 April 1866 which falsely claimed that the absence of a quarry in Meysapan[102] proved that the Meysapan stone (*piedra de Meysapan*), the material approved in the blueprint, was not utilized in the actual construction of the structure. The defendant added that this malicious report by the military engineers and their inaccurate inspection of the prison project became the basis of the government´s suspicion that the contractor, architects, and inspectors indeed committed grave offense.[103]

Despite this reasoning, the courts in Manila found Juan Rom guilty of fraud (*estafa y fraude*). While preparing for an appeal, Rom penned a letter to the metropolis on 15 August 1868 reasserting his innocence while throwing the blame on the bureaucracy and power players in the colony. He also pleaded that he be reinstated as an architect in the peninsula. Madrid sent a reply on 5 November 1868 stating that the conduct of Rom with regard the Bilibid project was already tried and this was reason enough for him to be prohibited from performing his profession. This judgement of the

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[100] Francisco Lorenzo, *Defensa del arquitecto Don Juan Rom en la causa número 580 del Juzgado de Hacienda de Manila.* Madrid. 1868 in A.P.C. Griffin, *List of Books on the Philippine Islands in the Library of Congress.* Washington: Government Printing Office, 1903.

[101] AHN, Ultramar, 477, Exp. 18. ¨Expediente personal del arquitecto de Hacienda en Filipinas Juan Rom¨. 1868-1879. Carta de Juan Rom, 15 de agosto de 1868.

[102] An area presently between Guadalupe and Parañaque. Guadalupe in present-day Makati was known for its *piedra de Guadalupe* used in masonry work during the time.

[103] AHN, Ultramar, 477, Exp. 18., Expediente personal del arquitecto de Hacienda en Filipinas Juan Rom, 1868-1879, Carta de Juan Rom, 15 de agosto de 1868.

courts led to his dismissal from office, denial of salary and privileges, and eventually his imprisonment in Manila. In 1872, he was transferred to Spain to serve his sentence in the Alcalá de Henares prison. Citing that the case brought ¨unpleasant and harmful incidents to the State¨, the Bilibid problem led to the removal of the architect, draftsmen, and staff involved in the project and the appointment of the then newly-created *Inspección General de Obras Públicas* (IGOP) to take over the job. [104]

When the IGOP was established, it was tasked to scrutinize the different construction projects. This power to regulate was illustrated in an instance when Inspector General José María Borregón expressed his disapproval of a construction project endorsed by the Political-Military Commandant of Romblon in 1884 because the proposal ¨did not provide an idea of the kind of work that is to be constructed and is therefore not susceptible to technical examination nor a justification on the results of the public work¨[105]. Not only were projects inspected, the performance of IGOP personnel themselves came under scrutiny. This was the case of Rafael de Luque, an *ayudante* or a lower-ranking official in the IGOP bureaucracy who was assigned in Laguna and was suspended for ¨mistakes committed in the works¨ specifically on the bridges of Liliw, Oplec, y Talaibing in the province of Laguna.[106]

[104] Ibid.
[105] AHN, Ultramar, 572, Exp. 4, Expediente general de organización del servicio de Obras Públicas de Filipinas y distribución del personal: Extracto, segunda parte. Tramitación de los expedientes de Obras Públicas. Propuesta de reforma de la legislación, 1888-1897.
[106] AHN, Ultramar, 573, Exp. 3, Estados trimestrales y memorias de obras públicas, 1866-1897.

Chapter 3.

Colonial Sanitation, Public Hygiene, and Social Control Reforms: Actors and Institutions

The creation of public works institutions ran parallel to the creation of organizations tasked to oversee the public health and sanitation concerns of the Philippines in the late eighteenth century to the nineteenth century. The memoirs, plans, and blueprints of many projects revealed that the approval *(visto bueno)* and medical expertise of the sanitary and public health professionals was vital in the materialization of any public works proposal at the time. The succeeding chapters would attempt to demonstrate the interchanges between the techno-scientific community of engineers and architects and the and medical colonial actors in the construction of sanitation infrastructures in the colony.

In Spain, the origin of sanitary institutions was attributed as a response to the growing concern for public health and well-being in the eighteenth century. The *Junta Suprema de Sanidad* was created in 1720 to coordinate the sanitary and public hygiene efforts of Spain to combat the epidemic that originated in Marseilles. Gerard Jori argues that this was a juncture towards the implantation of a permanent and centralized sanitary policy. The Junta became the designated institution that designed and drafted sanitation and hygiene regulations and instructions for the prevention of contagious diseases, the vigilance and inspection of the maritime sanitation (*sanidad marítima*), the production of knowledge concerning public health, and the creation of norms dealing with the sanitary problems of the time such as the cleanliness of the air; the management of cemeteries and burying of the dead; the location of factories and unhealthy manufactures; the location and conditions of public buildings; the management of vaccination against smallpox; the inspection and monitoring of the quality of beverages and foods; among others.[1]

Like in the metropolis, the first sanitation institution in the Philippines was also created primarily as a response to the persistent epidemic outbreaks in the colony, especially the smallpox outbreak that hit Manila and the islands in the 1790s. These waves of epidemics bared the colony´s lack of public health institutions to respond to epidemics. By the nineteenth century, organizations like the *Junta de Sanidad/Junta Superior de Sanidad* and the *Subdelegación de Medicina y Cirugía* and the *Subdelegación de*

[1] Gerard Jori (2013), pp. 135-138

Farmacia played important role in the advancement of public health discourse and the articulation of the unique environmental realities of the Philippines.

In the late eighteenth century to the mid-ninetenth century, these institutions were composed by military doctors and health professionals. The incorporation of civil health professionals would only begin in the last quarter of the nineteenth century when the *Facultad de Medicina y Cirugía* of the University of Santo Tomas in Manila started to produce its first medical graduates after the faculty´s establishment in 1871.

The colonial government and the city council of Manila as well as the engineers and architects depended on the expertise of the medical professionals of these organizations in the planning and construction of many public works projects in the capital. On the other side, the engineers and architects themselves were named as permanent members of the *Junta de Sanidad* by the late nineteenth century. The intersected urban need for infrastructures and the overlapping challenges of sanitation, order, and control prompted as well the interconnection of institutions relating to public works and public health and sanitation.

A. The creation of the *Junta de Sanidad* in Manila

On 18 January 1790, Gov. Gen. Félix Berenguer de Marquina wrote to the King informing a smallpox outbreak that occurred in Manila in 1789. This epidemic eventually spread to the different provinces in 1790 to 1791. The smallpox epidemic which was considered by the colonial authorities to have had originated five leagues outside of Intramuros exposed several inadequacies of the colony. First, Berenguer de Marquina reported to Spain that resources were lacking, if not unavailable, to assist the needy and the sick. The palliative efforts of the government consisted in convincing the parish priests and religious orders to organize a charity fund for those afflicted.[2] Due to the insufficiency of central funds, the colonial government called on the Consulate of Manila and the Obras Pías of the city to allocate resources for the immediate relief of those affected. However, the city merchants and the Franciscan friars were only able to appropriate 3,000 pesos and 500 pesos respectively, an amount that was too little to arrest the effects of the malady in the capital. Second, the epidemic demonstrated that the capital lacked the institutions that would be in the frontline in the management and control of

[2] Montero y Vidal, tomo II, p. 339.

disease outbreaks. Like in the earlier times, the parish priests again were the ones who were designated to ascertain the condition of the inhabitants and identify the needs of each town and barrio in the 1789 to 1791 epidemic.[3] The epidemic was followed by a series of natural calamities. In 1796, Manila and the nearby provinces felt ¨one of the strongest earthquakes to ever hit the archipelago¨.[4] A strong typhoon hit the colony in 1797 which toppled down houses and trees and took thousands of lives.[5]

After being informed of what happened in the capital and ¨to remedy the ill effects should another outbreak occur¨, the King signed a royal cedula ordering the establishment of a Council of Health or *Junta de Sanidad* that would address the problems and needs caused by epidemic explosions in the colony. Aside from the establishment of a health commission, the central government in Madrid also ordered the authorities in the islands to carry out the proper and vigorous regular sanitation and health inspections in the ports and communities¨ to prevent the spread of epidemics and contagious diseases.[6]

While these arguably were initial steps to bigger sanitary reforms, the composition of the *Junta de Sanidad* in Manila in the late eighteenth century remained mostly in the hands of the political and religious officials in the capital. According to the royal decree, the commission was to be comprised of the Archbishop of Manila, two ministers of the Audiencia de Manila (the president of the Audiencia and the chief accountant of the Tribunal), two persons appointed by the Consulate of Manila, and the representatives of the *Casa de Misericordia* of the Franciscans and Dominicans.[7] The explicit appointment of medical or health personnel in the commission was inexistent in the decree.

The *Junta de Sanidad* became the highest administrative organ relating to matters of sanitation and public health in the archipelago. In the early years of the nineteenth century, it was tasked to assist the *Junta Central de Vacuna*, a new council created on 20 December 1806 to undertake the philanthropic mission of conducting vaccination in the colony.[8] The two councils aside from the civil and religious officials in the colony came up with regulations for the inoculation principally targeting the children in Manila and its surrounding suburbs. During Gov. Gen. Mariano Fernández de Folgueras´ administration

[3] AGI, Filipinas, 338, L.22, F.48V-52R, Orden sobre socorros para remediar epidemias, 25 de enero de 1794.
[4] Montero y Vidal, tomo II, p. 353.
[5] Ibid., p. 348.
[6] AGI, Filipinas, 338, L.22, F.48V-52R, Orden sobre socorros para remediar epidemias, 25 de enero de 1794.
[7] Ibid.
[8] Through the royal order of 1 September 1805. Buzeta, p. 169. Montero y Vidal recorded 1803 instead of 1805.

(1806-1810), campaigns were done to propagate the vaccination in other part of the colony.[9] The colonial government observed that the initiative resulted to a great increase in population which was previously decimated by the terrible smallpox infections.[10] This did not translate however to full compliance as it was reported that the natives resisted the vaccination. This caused the implementation of stricter rules requiring that children be presented to the civil administrators or parish priests so that they may be vaccinated.[11]

The scant archival records on the *Junta de Sanidad* in the first half of the nineteenth century limit our knowledge with the institution´s development. Although, we know that it´s role was central during times of epidemics and health crisis like the 1820 cholera that seriously wreaked havoc in Manila.[12] Many cases of illness were documented in the communities near the Pasig river. As a result, then Corregidor of Tondo Don Luis Rodríguez Varela, ordered the prohibition of the use of the waters of Pasig. As a response, the colonial government resuscitated the Junta de Sanidad. A *congregación de beneficiencia* was also created composed of the religious order and residents of the capital to extend charity to those afflicted. Different measures were taken involving the *boticas,* charitable institutions and covents, as well as the participation of some ship *surgeons* or cirujanos. However, according to official sources, the natives were convinced that the disease was caused by the poisoning of the waters and food by the French and other foreigners in the city. This resulted to a series of city riots on 9 October 1820 leading to the sacking of houses, killing of foreigners perceived to be carriers and spreaders of the disease, and the robbing and killing of Chinese in Manila´s suburbs.[13]

The Junta Superior de Sanidad was abolished in Spain through a royal order on 5 November 1834. However, the needs and exigencies of the colony pushed the colonial government in the Philippines to maintain the existence of this organ in the islands.[14] By the 1850s, a clearer organizational structure of the Council could be observed. The administration of public health in the colony was composed of the governor general of the islands who also served as the council´s president; the mayor (*alcalde de 1ª elección*) who served as the vice-president; six appointed councilors (*vocales natos*) composed of

[9] Montero y Vidal, tomo II, p. 388.
[10] Montero y Vidal, tomo II, p. 366.
[11] Montero y Vidal, tomo III, p. 148.
[12] See: Patricio Hidalgo Nuchera, *Liberalismo e Insurgencia en las Filipinas 1809-1824* (Madrid: UAM Ediciones), 2019. Hidalgo Nuchera offers new data and analysis on the event by locating it in the broader context of tensions between the peninsular Spanish and the creoles.; Huetz de Lemps (1990).
[13] Montero y Vidal, tomo II, p. 453.
[14] *Guía de Forasteros en las Islas Filipinas para el año de 1856,* Manila: Imp. de los Amigos del País, 1856, p. 98.

the *regidor decano*[15], a public prosecutor or *síndico procurador*[16], military officials of the port of Manila (captain and inspector of all ships entering and leaving the port), two medical doctors appointed by the *Ayuntamiento*[17]; and a secretary of the Council who was typically part of the Military Health Corps. Table 1 lists some of the identified medical or health professionals that were part of the Junta de Sanidad in the mid-nineteenth century as compiled from scant available sources. These men represented the military doctors who were trained in the peninsula and appointed to serve in the overseas territories of Spain.

Year	Name
1851	Antonio Codorníu y Nieto (secretary)[18]
1852	Antonio Codorníu y Nieto (secretary)
1853	Antonio Codorníu y Nieto (secretary)
1856	Antonio Codorníu y Nieto (secretary) Francisco Lasida (appointed by the city council) Mariano Casagemas appointed by the city council)
1858	Rafael Fantoni (secretary)
1860	Rafael Fantoni (secretary)
1861	Rufino Pascual de Torrejón (secretary) Pablo Nalda (appointed by the city council)
1863	Enrique Suender (secretary) Pablo Nalda (appointed by the city council) Manuel Cosp (appointed by the city council)

Table 1: List of identified medical/ health professionals in the Junta de Sanidad in select years
Source: Data from the Guía de Forasteros for the years 1851, 1852, 1853, 1856, 1858, 1860, 1861, 1863

From this list of names, we know that Fantoni was a product of the Real Colegio de Medicina y Cirugía de San Carlos. Aside from serving as secretary of the Junta de Sanidad, he also became subdelegate of the *Subdelegado de Medicina y Cirugia* in the Philippines.[19] Rufino Pascual de Torrejon (1827-1882) Formed part of the Military

[15] The Spanish bureaucratic structure for towns delegated to the the councilors or *regidores* the task to direct, supervise, and push for the sanitary, police, educational, economic undertakings of the ayuntamiento. See: Alfredo Gómez Martínez, ¨Cargos y Oficios Municipales en las Ciudades de León, Zamora, y Salamanca durante el reinado de Carlos III¨ *Estudios Humanísticos. Historia.* No. 5, 2006, pp. 159-184 p. 171

[16] The *procurador síndico* attends the sessions of the Ayuntamiento representing the common interests of the residents, normally matters relating to governance and policy. See Gómez Martínez, p. 174.

[17] Medical doctors Francisco Lasida and Mariano Casagemas as documented by *Guía de Forasteros, 1856.*

[18] A discussion of his life and contribution to the sanitary development in the Philippines will be discussed in the next pages.

[19] AHN, Universidades, 1198, Exp. 95, Expediente de Rafael Fantoni Genesi.

Health Corps. Before he became the secretary of the Junta de Sanidad, he served first as secretary of the *Subinspección de la Sanidad Militar* in the islands. Apart from his service in the Philippines, he was appointed as health chief of a Spanish expedition to Cochinchina in 1858. In the 1870s, he served in the Military Hospital of Manila. He died in the Philippines during the 1882 cholera epidemic after having been appointed three times in this Spanish overseas territory.[20] Enrique Suender (1827-1897) is considered to be the first Spanish urology specialist. He served from 1858-1862 in Manila. Aside from being appointed as secretary of the Junta de Sanidad, he was also a member of Real Sociedad Económica de Amigos del País de Manila.[21] Meanwhile, A closer examination of the life and works of Antonio Condorniu y Nieto will be provided in the succeeding pages.

By the last quarter of the nineteenth century, the Junta Superior de Sanidad´s organizational structure could very well reflect the important role played by the institution in addressing the sanitation and public health concerns of a colony that was in the midst of finding its way to the road of modernization. The civil administration of the islands took the lead and named the inspector general of public works and mines, the engineers and architect of the government, and the military health corps as permanent members of the Council. Meanwhile, the elected members were composed of two medical doctors, two pharmacists, one veterinarian, and some representatives of the economic sector.[22]

B. The founding of the *Subdelegación de Medicina y Cirugia* and the *Subdelegación de Farmacia*

Before the mid-nineteenth century, two other institutions that played a central role in the sanitary discourse and public health concern in the colonies in the colony were created. The foundation of the *Subdelegación de Medicina y Cirugía* and the *Subdelegación de Farmacia* originated from the Madrid-based Junta Suprema de Sanidad´s proposal on 12 October 1842¨to ensure the compliance of the provisions relating to the exercise of [sanitation and medical] professions¨.[23] These institutions

[20] A. Belaústegui Fernández, *Sanitarias Militares en Filipinas, 1521-1898*: *La lucha contra el olvido VII* (Servicio de Publicaciones del Ministrio de Defensa, 2012).
[21] Fernando Martín-Laborda Bergasa, ¨Aportación de la Medicina Militar de Madrid a la Urología Española,¨ Memoria Grado de Doctor. Facultad de Medicina, Universidad Complutense de Madrid, 2003, pp. 72-87.
[22] Guía Oficial de las Islas Filipinas para los años 1884, 1885, 1886, 1891, 1894, 1895, 1896, 1897, 1898.
[23] Montero y Vidal, tomo II, p. 58.

arguably contributed to a more centralized identification and organization of the sanitary professionals at the time.

The *Subdelegación de Medicina y Cirugía* and the *Subdelegación de Farmacia* were under the jurisdiction of the *Junta de Sanidad.* The subdelegates were appointed by the Governor General of the islands subject to the royal approval in the metropolis. The members of the subdelegation served as members of the Junta de Sanidad as inspectors of medicine and public health in the islands. Table 2 is a compilation of medical experts who served in these institutions in the mid-nineteenth century.

Year	Subdelegación de Medicina y Cirugia	Subdelegación de Farmacia
1851	Subdelegate: Mariano Omedez de Viela/Mariano Umerez de Villa Doctors (*facultativos*): Francisco Lasida (licenciado en medicina y cirugía) Lorenzo Negrao (cirujano) Eduardo Rich	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque (secretary) Spanish Pharmacists Juan García Baden; Victorio de los Reyes, Marcos Ponce de León Foreign Pharmacists in Manila Jacobo Zobel, Enrique Rodbertus, Herman Paepke
1852	Subdelegate: Mariano Omedez de Viela/Mariano Umerez de Villa)	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque (secretary) Spanish Pharmacists Juan García Baden; Victorio de los Reyes, Marcos Ponce de León Foreign Pharmacists in Manila Jacobo Zobel Hinch and Herman Paepke
1853	Subdelegate: Mariano Omedez de Viela/Mariano Umerez de Villa Doctors (*facultativos*): Francisco Lasida (licenciado en medicina y cirugía) Lorenzo Negrao (cirujano) Tomás Calvo (licenciado en medicina y cirugía)	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque (secretary) Spanish Pharmacists Juan García Baden; Victorio de los Reyes, Marcos Ponce de León Foreign Pharmacists in Manila Jacobo Zobel and Herman Paepke

	Juan Foulerton (Doctor en medicina y cirugía)[24]	
1856	Subdelegate: Mariano Omedez de Viela/Mariano Umerez de Villa Doctors (*facultativos*): Rafael Fantoni José Martinez José Eizaguirre Juan Foulerton	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque y García, Jacobo Zobel (Manila), Marcos Ponce de León (Intramuros), Manuel Manzaneque (Escolta), Juan García Baden (plaza de Binondo), Victorio de los Reyes (Sto. Cristo, Binondo)
1858	Subdelegate: Rafael Fantoni (former director of the Military Hospital of Manila, awarded with the *Cruz de Epidemias*) Doctors (*facultativos*): José Martinez José Eizaguirre Juan Foulerton	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque y García, Pharmacists Jacobo Zobel; Juan García Baden; Victorio de los Reyes, Marcos Ponce de León, Carlos Wegner, Luis Vallarini, Antonio Leogardo y Oriola, Angel Bautista Salamanca, Juan Enrique Schmidt, Cecilio Urbina José, Mariano Formentos, Guillermo Borries
1858	Rafael Fantoni (secretary)	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque y García Pharmacists Jacobo Zobel; Juan García Baden; Victorio de los Reyes, Marcos Ponce de León, Carlos Wegner, Luis Vallarini, Antonio Leogardo y Oriola, Angel Bautista Salamanca, Juan Enrique Schmidt, Cecilio Urbina José, Mariano Formentos, Guillero Borries
1860	Doctors (*facultativos*): José Martínez José Eizaguirre Juan Foulerton Gabriel Legaspi y Alcoriza	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque y García, Bernardo Henando, Fernando Bau y Gasco Pharmacists Jacobo Zobel; Juan García Baden; Victorio de los Reyes, Marcos Ponce de León, Luis Vallarini, Antonio Leogardo y Oriola, Guillero Borries, Ángel Bautista Salamanca, Juan Enrique Schmidt, Cecilio Urbina José, Mariano Formentos

[24] Foulerton was a foreigner so he had to ask for a permit to exercise his profession.

1861	Subdelegate. José Branguli	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque y García, Bernardo Henando, Fernando Bau y Gasco Pharmacists Jacobo Zobel; Juan García Baden; Victorio de los Reyes, Marcos Ponce de León, Luis Vallarini, Antonio Leogardo y Oriola, Guillero Borries, Angel Bautista Salamanca, Juan Enrique Schmidt, Cecilio Urbina José, Mariano Formentos
1863	Subdelegate: Quintín Meinet Doctors (*facultativos*): Juan Foulerton José Martínez Juan Burke Cristian Kauffman	Subdelegate: Ildefonso Pulido y Espinosa Manuel Manzaneque y García, Bernardo Girela, Juan Guijarro, José Alemani, Vicente Martinez (assistants of the Military Health Corps, Pharmacists Jacobo Zobel; Juan García Baden; Victorio de los Reyes, Marcos Ponce de León, Luis Vallarini, Antonio Leogardo y Oriola, Guillero Borries, Ángel Bautista Salamanca, Juan Enrique Schmidt, Cecilio Urbina José, Mariano Formentos, Jorge Federico Esderhost

Table 2: Composition of the Subdelegación de Medicina y Cirugía and the Subdelegación de Farmacia in select years.
Source: Costelo, 2020. Elaborated by using the data from the *Guía de Forasteros* for the years 1851, 1852, 1853, 1856, 1858, 1860, 1861, 1863

The establishment of the Faculty of Medicine and the Faculty of Pharmacy in the University of Santo Tomas in 1871 as one of the products of the educational reforms that were pushed during the second half of the nineteenth century signified two things. First, it meant that the conferring of medical and pharmaceutical competence, which was once under the mandate of the *Junta de Sanidad*, was already transferred to these educational institutions. Second, it meant the beginning of the formation of *Filipino* civil health professionals-criollo and mestizo experts that were born, educated, and trained in the colony such as Anacleto del Rosario, known as Father of Philippine Science and Laboratory, of Chinese-native descent who served as the first Filipino director of the Laboratorio Municipal de Manila; and León María Guerrero, a revolutionary and writer, who was one of the first batch of pharmacists of the Faculty and served as member of the health council of Manila in 1889.[25]

[25] José María de Jaime Lorén, *Crónica de Ciencias Médicas de Filipinas: Revista de Medicina, Cirugía y Farmacia (1895-1897*) Teruel: Centro de Estudios del Jiloca, 2014. See also: Martínez (2020), in press and Anduaga (2020), in press.

Lack of personnel characterized the first years of the Faculty of Medicine with only three professor doctors: Rafael Guinard, Mariano Marti, and Quintin Meynet. In the succeeding years, more doctor professors joined the university specializing in anatomy, public and private physiology and hygiene, general pathology, legal medicine, toxicology, etc.[26] Similar to the Faculty of Medicine, the Faculty of Pharmacy had only three doctor professors when it began namely Inocencio Madrigal y Garrido, José Chicote, and Ramón Botet. The educational institutions grew through the years and had almost 42 faculty members by the end of the Spanish rule in the islands. Juan Regodón Vizcaíno argues that the establishment of these two Faculties resulted to the introduction of the latest European medical tendencies to the colony. These new ideas were reflected in the doctors´ writings on diseases in the colony, indigenous ecology, hospital memories, health reports, etc... .[27]

The first batch of graduates of the Faculty of Pharmacy was composed of Fernando Benítez Aguilar, Rafael A. García, León María Guerrero, Aniceto Manuel R. Merenguel, Ricardo Regidor, and Tomás Torres.[28] León María Guerrero, Filipino a revolutionary and writer, was actually one of its first graduates.

Through time, more doctors graduated from these two Faculties. However, positions in medical institutions (*Junta de Sanidad*, *Junta Central de Vacuna*, later on *Inspección General de Beneficiencia y Sanidad*, and the *Subdelegación de Medicina* y *Cirugía*) were still mostly exclusive to Spanish-trained doctors and health experts. This became a point of contention in the practice of medicine in the colony as this new breed of sanitary professionals pushed not only for more representation of real medical experts in these organizations but also provided a different perspective on issues of public health and sanitation in the colony.

C. Sanitary Professionals, the Hygienist Movement, and Medical Topographies: Changing the Discourse of Public Health and Sanitation in the Philippines

[26] Some of these doctors-professors Carlos Nalda, Miguel Pina, Gregorio Mallen y Sainz, Emilio Marasi, and Carlos Alvarez Perera were also members of the Subdelegation of Medicine and Surgery.
[27] Juan Regodón Vizcaíno, *Contribución al Estudio de la Medicina en las Islas Filipinas en la Segunda Mitad del Siglo XIX*, Dissertation. Universidad Complutense de Madrid, Madrid, 1990, p. 38.
[28] Ibid., pp. 38-42.

The institution of the first sanitary organizations in the late eighteenth century to the increased presence of sanitary professionals in the late nineteenth century arguably led to the introduction of new public health discourse in the Philippines. These military and civil medical specialists that arrived in the archipelago was a breed of professionals formed and exposed in the framework of the dominant hygienist and public health movement that swept the European societies at the time.

The hygienist movement or the sanitary reform movement pushed for the advancement of public health in societies. It was the concretization of the nineteenth century´s great sanitary awakening. The hygienists predominantly identified urban spaces as potential threats to public health and hygiene. Cities were typically viewed as foci of infection and susceptible to epidemic outbreaks largely due to their population density, squalid living situations, and poor sanitary conditions. Markets, slaughterhouses, cemeteries, sewerage, hospitals and prisons were viewed as miasmatic hotspots while urban housing, street configuration, and the residents´ mode of living were subjected to salubrity inspection and scrutiny.[29]

In the British empire, the movement gained significant traction with the publication of Edwin Chadwick´s *Report on the Sanitary Conditions of the Labouring Population of Great Britain* in 1842 which directly correlated poor sanitary conditions to the growth of diseases.[30] In Spain, the hygienist movement could be traced in the earlier Enlightenment reformist ideas of the past century which were sustained in the liberal framework of the nineteenth century. The spread and impact of this public health and hygiene doctrine could be examined in the numerous works on *higienismo* that was produced in the 1730s to 1930s.[31] The pioneering works on medical literature, diseases, public and private health and hygiene of Mateo Seoane[32], Pedro Felipe Monlau[33], and

[29] Luis Urteaga, ¨Miseria, Miasmas y Microbios. Las Topografías Médicas y el Estudio del Medio Ambiente en el Siglo XIX,¨ *Geo Crítica Cuadernos Críticos de Geografía Humana,* año V, número 29, (Nov 1980).
[30] Edwin Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain,* London: W.Clowes and Sons, 1843.
[31] Rafael Alcaide González, ¨Las Publicaciones Sobre Higienismo en España Durante el Periodo 1736-1939: Un Estudio Bibliométrico,¨ *Scripta Nova Revista Electrónica de Geografía y Ciencias Sociales,* no. 37 (1 April 1999). no pagination- In Spain, the three principal cities of Madrid, Barcelona, and Valencia became the centers of publication of these works.
[32] Alcaide González notes that Seone´s exposure and exile to British territories was important in the development of his sanitation ideas. Seone played an important role in the elaboration of the Ley General de Sanidad de 1855.
[33] One of his importants works is *Elemento de Higiene Pública o Arte de Conservar la Salud de los Pueblo*s, 1847.

Francisco Méndez Alvaro[34] were considered as the widely-known nineteenth-century transmitters of the Spanish hygienist discourse which influenced the direction of the public health laws and sanitation movement in the empire at the time.[35] Eventually, these ideas would spread not only among Spanish health professionals in the Iberian territory but in the overseas colonies as well. The dissemination of these doctrines in the Ultramar was concretely demonstrated in the publication of medical-geographical knowledge known as medical topography (*topografía médica*).

One example of a medical topography is the study undertaken by Antoni Codorníu y Nieto, a military medical doctor who served as secretary of the Junta de Sanidad in the Philippines. Codorníu received his *Licenciado en Medicina y Cirugía* in the Spanish metropolis in 1838. After serving in the military hospital of Madrid, he was assigned to the Philippines as *Jefe de Sanidad Militar*. Documenting his experiences while visiting the different islands in 1845-46, he wrote the *Topografía Médica de las Islas Filipinas* that was later published in 1857. This work formed part of the growing nineteenth-century tradition of producing medical geographies grounded on the idea of understanding the correlation between the environmental and geographic conditions in the development of disease. Producing medical topographies was one of the varied ways through which empires ¨mapped and documented¨ their colonies under their agenda of ¨discerning the environmental cause of disease¨ and ¨identifying salubrious places¨ in their colonized territories.[36] In studying colonial societies, these projects of knowledge production were viewed as ¨tools of empire¨ where medicine and geography were utilized to advance the exploitation and expansion of imperial interests.[37]

Codorníu wrote on the importance of studying the ¨special circumstances of the islands [and] produce reports on public hygiene¨. His writing was very much reflective of the hygiene discourse that had dominated the public health movements in Europe and the production of medical geography studies in Spain in the first decades of the nineteenth century. According to him, he employed in his research the ¨modern view¨ that matters

[34] A follower of Seoane who wrote many articles in periodicals and magazines and became director of the magazine *El Siglo Médico.*
[35] Rafael Alcaide González. ¨La Introducción y el Desarrollo del Higienismo en España durante el Siglo XIX. Precursores, Continuadores y Marco Legal de un Proyecto Científico y Social,¨ *Scripta Nova Revista Electrónica de Geografía y Ciencias Sociales,* no. 50 (15 octubre 1999).
[36] Wendy Jepson, ¨Of Soil, Situation, and Salubrity: Medical Topography and Medical Officers in Early Nineteenth-Century British India,¨ *Historical Geography,* 32 (2004), pp. 137-138.
[37] Daniel R. Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century* (New York/Oxford: Oxford University Press, 1981).

related to public and private hygiene could be categorized into six: *circumfusa, ingesta, excreta, applicata, percepta y gesta.* [38] These categories actually date far back to Hippocrates´classic treatise on *Air, Waters, and Places* and Galen´s *Ars medica* but remained dominant in the discourses of public health reformers at the time.[39] For instance, this theme became the subject of M. Hippolyte Royer-Collard, a French doctor who was a member of the Consultative Committee on Public Hygiene (*Comitè consultative d´hygiène publique)* in France and chair of Paris Faculty of Medicine from 1837 to 1850[40] in his several discourses on the *Classifications and Methods of Hygiene* published in the London-based The Medical Times in 1848.[41]

Codorníu reiterated and applied these in the context of the Philippine Islands arguing that these were cornerstones of public and private hygiene. *Circumfusa* or surrounding objects deal with matters regarding the atmosphere (air, heat, etc) earth, and water (climate, soil, etc.). *Ingesta* pertains to matters introduced into the organism such as food and drink, *excreta* are those designed to be ejected from the organism such as natural and artificial evaculations, *aplicata* refers to matters applied to the surface of the body namely clothing, cosmetics, medicinal application, etc., *gesta* relates to the voluntary movements of the muscles like waking, sleep, motion, etc., and lastly *percepta* concerns the ¨functions and impressions which depend upon the sensibility and upon the organization of the nerves¨. His medical topography of the Philippines was produced by exploring and documenting the tropical environment of the islands through the atmospheric conditions, humidity, bodies of water, soils, landscapes, climate, vegetation, alimentation, and social habits of clothing, habitation, etc. and their connection to the inhabitant´s health and hygiene circumstances. Taking into consideration all socio-environmental factors, Codorníu concluded that the province of Tondo, of which Manila was included, was one of the most insalubrious province in the archipelago.[42]

Codorníu cited some of the factors leading to the province´s insalubrity. He warned of the abundance of harmful miasmatic secretions especially in Manila due to its

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[38] Antonio Codorníu y Nieto, *Topografía Médica de las Islas Filipinas* (Madrid: Imprenta Alejandro Gómez Fuentenebro, 1857), p. 11.
[39] M. Hippolyte Royer-Collard, ¨A Course of Lectures on Public Hygiene Delivered at the Faculty of Medicine, Paris. Classifications and Methods of Hygiene.¨ in *¨The Medical Times. A Journal of Medical and Chemical Science October 14, 1848 to June 30, 1849*, vol. XIX (London:WMS. Orr and Co., 1849).
[40] Ann La Berge, *Mission and Method. The Early-Nineteenth-Century French Public Health Movement* (Cambridge: Cambridge University Press, 1992), p. 194.
[41] Rogaski (2004), p. 6.
[42] Codorníu y Nieto (1857), p. 323.

very high temperature, enclosed ventilation, and presence of several foci of infestation.[43] He emphasized that the Pasig river which served as the main source of water for Manila´s approximately 200,000 inhabitants was an example of this infection hotspot:

> The Pasig river serves as a drain from the lake of Bay. As a receptacle of dirty and filthy waters throughout the province, many dead animals and a multitude of decaying aquatic plants are always seen floating on its surface, which transform into a complete state of putrefaction after being exposed to the heat of the sun. During the dry season, its water level drops which exposes many lands imbued with decaying waste matter…The stagnant waters which exist in large numbers are perhaps the main cause of most of the diseases that afflict the European race and cause death to many natives.[44]

He also stressed that the presence of a multitude of estuaries (esteros) which enveloped the entire capital was both a boon and bane because while ¨they facilitated the interior mobility of the residents, the neglect of the residents left these bodies of water covered with garbage and decaying animals and matter that produce lethal emissions¨.[45]

His writings served as mouthpiece for important sanitary reforms or to criticize some government policies affecting Manila´s urban living conditions. For instance, in the desire to eradicate houses made of light construction materials (e.g. *nipa, cogon, and caña*) known to be fire risks in the capital, the government prohibited the construction of these types of houses and ordered the poor residents of the capital to move to a new type of dwellings called *posesiones* or *accesorias.* Unlike the *nipa* and bamboo house which were more suited to the environmental conditions and unique social practices of the natives, the *posesiones* were common houses constructed in small parcels of land. The structures, reminiscent of present-day apartments, were squatty, humid, and lacked ventilation partitioned into many small rooms. Families with numerous members and native and Chinese urban workers were all cramped up in these confined rooms turned to homes. Their only source of ventilation were the pathways that led to a small patio with a common door. Most of the times, human and animal waste were all conglomerated in these lodgings. Codorníu did not mince words when he urgently called for a reform in the construction practices in the colonies and categorically said that these poorly-designed dwellings and all other edifices and structures that contribute to the accumulation of harmful airs were ¨perennial foci of infection¨ and that people exposed to these conditions

[43] Ibid., pp. 127-128.
[44] Ibid., pp. 79-80.
[45] Ibid., p. 81.

were most likely to be inflicted with different kinds of diseases.[46] Though Codorníu´s work was not devoid of racial annotations typical of nineteenth-century information production, this work was arguably monumental in enriching sanitation and public hygiene discourse in the nineteenth-century Philippines.

In the 1880s, the colony gained another public health and hygiene advocate in Francesco Capelo y Juan, a professorial chair (*catedrático*) in the Faculty of Medicine of Santo Tomas in Manila. Capelo y Juan´s strong views on how to improve the Philippines´and Manila´s sanitation conditions were palpable in a series of articles he wrote for the periodical *La Oceanía Española* (under the pseudonym Rui-Barbo) which the Faculty of Medicine eventually published as a compendium entitled *Manila, la Higiene y el Cólera* in 1883.

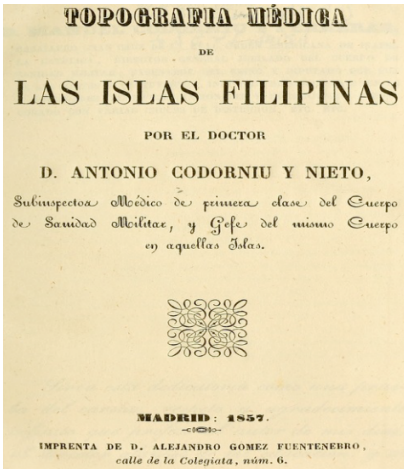
TOPOGRAFIA MÉDICA
DE
LAS ISLAS FILIPINAS
POR EL DOCTOR
D. ANTONIO CODORNIU Y NIETO,
Subinspector Médico de primera clase del Cuerpo de Sanidad Militar, y Gefe del mismo Cuerpo en aquellas Islas.
MADRID: 1857.
IMPRENTA DE D. ALEJANDRO GOMEZ FUENTENEBRO, calle de la Colegiata, núm. 6.

Figure 1: Cover page of Codorníu´s *Topografía Médica,* 1857
Source: BNE, Biblioteca Digital Hispánica

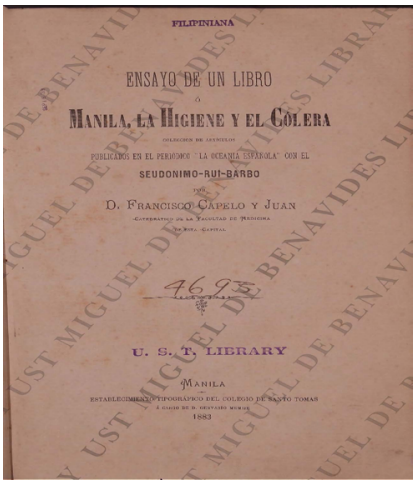
FILIPINIANA
ENSAYO DE UN LIBRO
MANILA, LA HIGIENE Y EL CÓLERA
SEUDONIMO-RUI-BARBO
D. FRANCISCO CAPELO Y JUAN
U. S. T. LIBRARY
MANILA
1883

Figure 2: Cover page of Capelo´s *Manila, la Higiene y el Cólera,* 1883
Source: UST, MB Library and Archives

Capelo y Juan did not censor himself when he criticized the unsatisfactory composition of the *Junta de Sanidad*, which he mockingly called the ¨*Junta Magna*¨. He denounced the continuous politicization of the health council dominated by non-sanitary authorities instead of real experts in the field of medicine and public health. He attributed this is as one of the factors why the Junta could not properly respond to important public health issues especially in times of epidemics. The medical doctor called on the appointment of more personnel with specialized knowledge and relevant training

[46] Ibid., pp. 127-128. This theme on *materiales ligeros y materiales fuertes* of building system was extensively studied by Huetz de Lemps (1998).

especially in the *Junta de Sanidad de Manila* in order to perform its multiple difficult obligations.[47] Calling on the government to involve more sanitary experts, he cited the growing human resources of the Faculty of Medicine composed of an increasing number of doctor-professors and chairs of public and private hygiene, experts on legal medicine, veterinarians, as well as specialists on Pharmacy.

Laying out instructions on private and public hygiene to improve the living conditions in the capital was one of the themes that Capelo y Juan articulated and underscored in his works. When the epidemic struck the capital in 1882, he called on the government to adopt the following sanitation and hygiene measures: streets, plazas, public establishments, patios, should be maintained clean; irrigation of streets and public areas should be done in regulation for the benefit of the general public; inspection visits should be undertaken to identify and eradicate centers of insanitation and contagion; markets, stores, slaughterhouses, and all industries involved in the alimentation of the general public should be controlled so that no noxious food and drink would be consumed by the people; quarantine areas and provisional shelters should be prepared to isolate persons living in cramped, unventilated, and tiny abodes*;* the establishment of provisional hospitals in different part of the capital should be ensured; the government should undertake a campaign of preventing the use of any other curative or preventive measures other than those recommended by science; all suburbs in Manila and towns should have doctors, pharmacists, and surgeons to be remunerated by the government; inspection commissions should be organized in communities; the excessive agglomeration of people especially in enclosed public spaces should be prohibited; and hygiene protocols should be observed in the conduct of dead bodies.[48] These measures were practically the same sanitary solutions and responses that were employed by the Americans during epidemic outbreaks in the early twentieth-century Philippines.[49] In other words, the change of colonial masters did not necessarily mean the disruption or complete differentiation of colonial policies. Actually, a persistence and modification of sanitary and public hygiene

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[47] Francesco Capelo y Juan, *Ensayo de un libro ó Manila, la higiene y el cólera [Texto impreso]: colección de artículos publicados en el Periódico "La Oceanía Española" con el seudónimo Rui Barbo* (Manila: Est. Tip. del Colegio de Santo Tomás, 1883), p.21.

[48] Ibid., pp. 111-113.

[49] See: Reynaldo Ileto, ¨Cholera and the origins of the American sanitary order in the Philippines.¨ in David Arnold (ed.) *Imperial Medicine and Indigenous Societies,* (Manchester and New York: Manchester University Press, 1988).; Warwick Anderson, *Colonial Pathologies: American Tropical, Medicine, Race and Hygiene in the Philippines* (Manila. Ateneo University Press copublished with Duke University Press, 2007).

policies took place during the last decades of the nineteenth century to the early decades of the new century.

Perhaps, Capelo y Juan could be one, if not the first, of the first medical professionals who introduced the modern ideas of industrial hygiene (*higiene industrial*) in the Philippines. He brought to light the plight of the working class and exposed the labor conditions and factors that were essential to the welfare of the wage-earners in urban Manila. His articles provided spotlight to the working environment in factories, workshops, and importance of these spaces to meet the essential conditions of salubrity; the need to construct housing for the labouring class, and provide efficient transportation for them. For instance, he commended the Manila-Malabon *tranvía* as an important step that would service those coming from the districts of Caloocan and Malabon but added that more aspects should still be improved for a working class ¨who for the most part of the day are exposed to overcrowded spaces, breathing insalubrious gases that are harmful for their health and well-being¨.[50]

Aside from Codorníu and Capela, more medical professionals published studies on public health, sanitation, hygiene, and medicine by the second half to the late nineteenth century such as Rafael Ginard Mas´ *Manual de medicina doméstica*[51] and the publication of the *Instrucción para el servicio del laboratorio, boticas y enfermerías militares de estas Islas* in 1869.[52] The *Manual del mediquillo visaya coordinado en visaya-cebuario* by Manuel Vilches de la Concepción[53] reflects the growing concern of the colonial administrators with regard the colony´s health not only in the Tagalog-speaking areas but also in the big Visayan population in the south. Towards the late nineteenth century, more studies on the colony´s state of public hygiene and health[54], on

[50] Capelo y Juan, p. 169.
[51] Rafael Ginard Mas*, Manual de medicina doméstica* (Manila: Imp. Ramírez y Giraudier, 1858).
[52] No author. *Instrucción para el servicio del laboratorio, boticas y enfermerías militares de estas Islas* (Manila: Imprenta Amigos del País, 1869).
[53] Manuel Vilches de la Concepción*, Manual del mediquillo visaya coordinado en visaya-cebuario,* (Manila: Ramírez y Giraurdier, 1877).
[54] Francisco Capelo Juan, *Cartilla higiénica* (Manila: Valdezco, Guevara y Cía. 1883); *Ensayo de Un libro, o Manila, la Higiene y el cólera* (Manila: Imp. G. Memije, 1883).; Rodolfo González Martín, *Estudio teórico-práctico sobre el empleo del agua en la higiene y patología aguda* (Manila: Imp. de Amigos del País, 1889).; Benito Francia Ponce de León, *Cartilla higiénica y prontuario de algunas medicinas de uso común en Filipinas* (Manila:np, 1894). Two works by Rodolfo González Martín, *Filipinas y sus habitantes. lo que son y lo que deben ser. Estudio crítico con exposición, además de varios preceptos higiénicos para la conservación de la salud en todo país tropical, v.g., Filipinas, Cuba, Puerto Rico y tantos otros* (Béjar: Est. Tip. De la Vda. De Aguilar, 1896).; *Cartilla higiénica para Filipinas y demás países tropicales* (Madrid: Nicolás Moya, 1897). Another book was published by Federico Montaldo Pero, *Guía práctica, higiénica y médica del europeo en los países tórridos (Filipinas, Cuba, Puerto Rico, Fernando Póo, etc.)* (Madrid: Imprenta de Fernando Rojas, 1898).

cholera[55] and other tropical illnesses[56] as well as pharmacology[57] were published. These sanitary and public health ideas were even discussed in non-medical magazines and periodicals at the time. For instance, the fortnightly magazine *Ilustración Filipina* (from March 1859 to December 1860) and the Revista de Filipinas dedicated a considerable number of pages to matters related to medicine, hygiene, public health, science, technology, ethnography, environment, and public works.

Specialized periodicals by the late nineteenth century also contributed to the propagation of current ideas and debates in the field of medicine and public health. In 1886, the *Boletín de Medicina* and the *Revista de Medicina y Farmacia* were established. During the eve of the revolution, other periodicals came to light such as the *Crónica de Ciencias Médicas de Filipinas* (1895), the *Revista Farmacéutica de Filipinas* and *Correpondencia Médica de Filipinas* in 1896.[58] These journals contained sanitary bulletins, notifications on public and private hygiene,[59] new developments in the field of medicine and health such as bacteriology and parasitology, the establishment and work of the *Laboratorio Municipal de Manila* and medico-legal laboratory of the capital, as well as the views and researches of medical professionals on the pressing sanitary issues confronted by the colony at the time. For instance, medical doctor and member of the Facultad de Farmacia de Manila, wrote an article titled *Triquina* warning the city´s meat sanitation inspection in markets and slaughterhouses and informing the public of the developments in parasitology[60] and the report of Don Vicente Cavanna, municipal doctor

[55] No author. *Cuadros gráficos del desarrollo del cólera en Manila, su provincia y hospitales. Segunda edición* (Manila: Lit. de M. Pérez, Hijo, 1881).; Pedro Robledo González *El cólera en Filipinas* (Madrid: Imp. F. Menéndez y Cía. 1883). No author. *Instrucción para la preservación del cólera* (Manila: Imp. M. Pérez hijo, 1885). Ramón Alba Martín, *Una epidemia colérica en Filipinas y ligeras nociones sobre la etiología de esta enfermedad* (Madrid:n.p. 1884). No author: *Cartilla higiénica y de desinfección en el caso de una invasión colérica*, (Manila: Imp. Chofré y Cía. 1888). Benito Francia Ponce de León, *Unas palabras sobre el cólera en Filipinas*. *Epidemia de 1888-1889*, (Manila: Imp. Chofré y Cía., 1889).

[56] Pedro Robledo González, *La lepra en Filipinas* (Madrid: Imp. F. Menéndez y Cía, 1883).; Aristón Bautista Lin, *Consideraciones acerca de los abcesos del hígado en los clímas cálidos. (Filipinas)*, Tesis del Doctorado (Madrid, Imp. La Nacional. 1891).; P. Saura Coronas, *De la fiebre hipertérmica perniciosa de Manila*. *Memoria de Doctorado* (Madrid: n.p. 1891). Ferdinand Roux, *Enfermedades de los países cálidos. Beri-beri. Fiebre fluvial. Traducida del francés por Santos Rubiana Herrera* (Manila: Imp. de "La Oceanía Española", 1894).

[57] Raimundo Lozano Megía *Cartilla medicinal según el sistema de medicinas caseras de "Jayne"* (Manila:n.p., 1879).; Trinidad H. Pardo de Tavera, *Plantas medicinales de Filipinas*, (Madrid: n.p., 1892.)

[58] Carlos Isabel, ¨Nacimiento y Evolución de la Presnsa en Filipinas en el Siglo XIX: De los Intereses Españoles al Nacionalismo Filipino,¨, *+Revista Internacional de Historia de la Comunicación,* no. 8 (2017) p. 14. pp.1-24

[59] For example: ¨Funesta Industria¨, Crónica de Ciencias Médicas de Filipinas, Tomo I, Año I, diciembre de 1895, p. 161.

[60] Juan Caro y Mora, ¨Triquina¨, *Crónica de Ciencias Médicas de Filipinas*, tomo I, Año 1 (agosto de 1895) 54-58 p. 54.

of the district of Tondo, of the alarming number of gastro-intestinal related deaths were reported due to the quality of water.[61]

D. Urban Police and Strategies of Control

This study examines the public works not only in the context of its conceptualization and construction but also in its governance and management. The public works were designed not only to address the sanitation needs and challenges of the capital but also to enforce order and control among the urban residents. By its simplest definition, social control refers to a ¨vast array of mechanisms and procedures to extract compliance of individuals or groups to some ideal standard of conduct¨.[62] According to James Scott, the state employs various forms of social control. In modern societies, the creation of the police force is crucial in the management and implementation of these forms of control. The power of the state to put in place systems of control could be understood in Greg Bankoff´s study on criminal justice in the nineteenth-century Philippines.[63] He proposed that beginning in the late eighteenth century to the nineteenth century, Spanish authorities established more organized judicial and legal institutions to respond to the increased incidence of crimes both in the rural and urban context. This increased criminality, perhaps due to the changing economic conditions of the colony and the rapid urbanization and social tensions, was observed in the beginning in the late eighteenth century to the nineteenth century, Spanish authorities established more organized judicial and legal institutions to in the Philippines. These apparatuses came in the form of laws, the creation of police forces and court systems to impose control over its subjects.

The rules and regulations were promulgated to shape the people´s activities and habits in these sanitation infrastructures. These came in the form of *bandos de buen gobierno* (proclamations of good governance), *reglamentos* (regulations), and *instrucciones* (instructions). These pertained to the regulations of the new urban lay out

[61] Vicente Cavanna, ¨Causas que favorecen las gastro-enteropatías en estos climas,¨ *Crónica de Ciencias Médicas de Filipinas*, tomo I, año 1, (agosto de 1895), pp. 47-53.
[62] James J. Chriss, *Social Control: An Introduction* (Cambridge: Polity Press, 2007), p. 1.
[63] Greg Bankoff, *Crime, Society and the State in the Nineteenth Century Philippines* (Quezon City: Ateneo de Manila University Press, 1996), pp. 54-58.

including streets and public spaces; regulations concerning the slaughterhouses and public markets; instructions concerning cemeteries and burial rights; as well as directives concerning water infrastructures and consumption. These will be discussed in further detail in the succeeding chapters.

The urban police played a key role in imposing control to these urbanscapes. The less structured urban militia of the late eighteenth century to the better-assembled *Guardia Civil Veterana* of the last quarter of the nineteenth century were the eyes of surveillance and arms of control of the colonial government. The urban militia *(milicia urbana)* had its origin in eighteenth-century Spain. In Philippines, the *milicia urbana de Manila* was created through a royal order on 10 December 1790. The historian Díaz-Trechuelo, however, mentioned that as early as 1778, Gov. Gen. José Basco y Vargas already made the initial steps in creating a regiment a few months after the captain´s arrival in the islands. The company had a strong civilian character since it was composed of armed Spanish residents tasked to provide additional defense for the capital.[64] Eventually, they became one of the early urban police force in the capital. During Gov. Gen. Rafael María Aguilar´s rule, this vigilance arm, was intensified to undertake the policing activities in the streets and public spaces of Manila. This police force composed of guards or *celadores* continued until the early decades of the next century. (See Chapter 2 for a more detailed discussion.)

To address the growing problems of urban vagrancy and lawlessness in public streets and spaces, a police force called ¨*comisión de vigilancia pública*¨ was created in 1826 during Gov. Gen. after Mariano Ricafort´s administration. It was tasked to ¨banish any seductive idea aimed at disturbing public peach and to cut the idleness and disorder¨ (*desterrar toda idea seductora, dirigida a perturbar el sosiego público y cortar la holgazanería y desorden*). The police commission exercised the implementation of the proclamations of good governance and instructions in the capital and the growing provinces of Tondo and Cavite, focusing mainly on street patrolling to capture undocumented individuals and disturbers of the public´s tranquility.[65] By the mid-nineteenth century, the colonial government´s policing activities were intensified with the establishment of a ¨Corps of public security guards¨ (*cuerpo de carabineros de seguridad*

[64] Díaz-Trechuelo (1964), p. 61.
[65] AGI, Ultramar, 515, ¨Reglamento para Establecer la Comisión de Policía, ordenada con acuerdo de la Real Audiencia de las Islas Filipinas, por su presidente el Excelentísimo Señor Don Mariano Ricafort, Gobernador y Capitán General, Superintendente General Subdelegado de Real Hacienda de las Mismas, Impreso en la Imprenta de Sampaloc¨, Año de 1826.

pública) and the ¨Police corps¨ (*tercios de policía*). Gov. Gen. Narciso Clavería (1844-1849) ordered the creation of a special force called the *Cuerpo de carabineros de seguridad pública* on 16 September 1847, approved through a royal order on 30 April 1848, to ¨pursue criminals and delinquents, maintain peace, order, security and carry out surveillance on the compliance of laws, ordinances, the edicts of good governance (*bandos de buen gobierno*).[66] The year after, another security force was created in the name of *tercios de policía* on 1 November 1849.[67] The intensification of public surveillance characterized Clavería´s administration as it also passed decrees against vagrancy and illegal gambling. Intensifed monitoring on the Chinese were also carried through the passing of a decree on their settlement, registration, taxes, and passports (*radicación, empadronamiento, capitación y pasaportes)* regulating their movement, mobility, and activities in the colony.[68] Half a decade after, the corps was renamed *Partidas de seguridad pública by* Gov. Gen. Antonio de Urbiztondo (1850-1853).[69]

By the last quarter of the nineteenth century, the urban police arm of the colonial government was intensified through the reorganization of the patrol forces and the creation of the *Guardia Civil Veterana.* Created in the context of the establishment of the *Guardia Civil* and the need to impose law and order in the islands during Rafael de Izquierdo´s regime (1871-1873), the *Guardia Civil Veterana* became a specialized police force for the public vigilance of Manila and its suburbs.[70] Recognizing the inefficiency of its predecessor *Cuerpo de Vigilancia Pública* in keeping the city dwellers comply with the urban norms and regulations, a Royal Order on 6 April 1872 was promulgated creating Manila´s urban police. In order to reach Manila and its suburbs, the urban police arm had its headquarters in Gen. Crespo Street in the arrabal of Sta. Cruz and was then subdivided into six districts each with its corresponding stations. These were (1) District of the walled city of Manila with its station at San Juan de Letrán Street (2) District of Sta. Cruz, Quiapo, and San José with its station at Enrile Street, Sta. Cruz (3) District of Binondo and San Nicolas with its station at Jolo Street, Binondo (4) District of Tondo with its station at Nueva Ilaya Street (5) District of Sampaloc, San Sebastián, and San Miguel

[66] Buzeta y Bravo (1850), vol. I, p. 144; Montero y Vidal, tomo III, p. 81.
[67] Montero y Vidal, tomo III, p. 88-89.
[68] Ibid.
[69] Ibid., p. 180.
[70] Ibid., pp. 560-561.

with its station at San Antón Street, Sampaloc; and (6) District of Ermita, Malate, Paco, and Concepcion with its station at Nueva Street between the barrios of Paco and Malate.[71]

Surveillance and police activities comprised the principal tasks of the *Guardia Civil Veterana*. These included the maintenance of public sanitation, hygiene, and order in streets and public spaces, slaughterhouses, and markets. They were also responsible in assuring that all rules with regard public cleanliness and public lighting were observed. The section was also tasked to regulate agglomeration in the housing condition of city dwellers and control that establishments deemed ¨dangerous and insalubrious¨ be situated in unpopulated areas. The urban police also controlled all ¨hazardous¨ activities such as burial of the dead. The patrol and inspection operations of the urban police up to some extent provide a glimpse on how the urban residents interacted with regard these spaces of control.

[71] *Reglamento para la Guardia Civil Veterana,* (Manila: [s.n.] 1872), p. 19.

PART I Concluding Notes

The paper trail of the public works projects followed a more or less similar process. In the case of colonial Manila, many infrastructural reforms were articulated in the deliberations of the city council meetings (*sesiones del cabildo*) composed by the city councilors and the mayor. The mayor then would normally appoint a commission, composed of councilors, the city architect and oftentimes of medical professionals, that would oversee the initial phase of the project. After undertaking fundamental research on the nature of the project, its benefits, costs, possible deterrents, and design of an initial blueprint, the commission would file a report to the Ayuntamiento. The latter would forward the report to the Treasury for budgetary allocations. In many instances, the initial report would also be relayed to the *Junta de Sanidad* and/or *Subdelegación de Medicina y Cirugia* to seek advice and recommendation. Moreover, the blueprint and project plan would be handed over to the *Inspección de las Obras Públicas* and the *Junta de Obras Públicas*, composed of engineers and architects, for the technical examination of the proposal. Once a concession and agreement is reached among the stakeholders, the *Inspección de Obras Públicas* would publish a final blueprint (*memoria del proyecto*) that would contain the rationale, the construction and design details, materials and supplies to be used, budget alignment, and all other standard technical specifications of the project. This document would then be submitted for approval of the Civil Superior Government in the islands, the technical approval of the *Junta de Caminos, Canales y Puertos* in Madrid (most especially for big projects), and ultimately of the central government in the Spanish metropolis.

The documentary track of the public works projects revealed that the conceptualization, materialization, and implementation of plans concerning Manila´s built environment were articulated and acted upon by the members of the municipal government, the techno-scientific experts composed of engineers and architects, the health and sanitary professionals, and the urban police. The innovative ideas with regard infrastructures and policies of sanitation, order, and control were transferred through actors and mediators that moved not only in the Spanish empire but also forged connections with the British and French powers and their colonies in the Asian region. These specialists and experts were products of the institutionalization and professionalization of public works and sanitation institutions- a characteristic of the late eighteenth to the nineteenth century which Cristopher Bayly popularly labelled as the

¨birth of the modern world¨. The public works projects were concretizations of the international spread of technological, ideological and commercial links and forces that gave birth to *¨a new style of urban living¨*.[72] This chapter seeks to understand the nature, composition, and organizational evolution of these colonial authorities and the actors that comprised these institutions and their role in shaping and Manila´s colonial built environment.

However, the previous three chapters of Part I affirm that the process of city-making was not equal and the same in the entire urban sprawl. This chapter proves that by the last century of Spanish rule, the divide was no longer simply between the settlements of *intramuros* vis-à-vis *extramuros.* Another urban bisection that could help us understand the urban evolution of Manila was the divide between the suburbs to the north or right bank of the Pasig river and those to the south or left of the bank. Greater commercial progress and higher population density spelled the difference between these two settlements. These contexts would play an important role in the planning and construction of public works projects at the time. Naturally, the commercially vibrant yet overcrowded and congested streets and suburbs to the north or right bank of the river such as Binondo, Santa Cruz, and Quiapo posed more serious sanitary concerns. It also followed that aside from Intramuros, these settlements would be given precedence in terms of urban services such as water supply, public lighting, street sanitation, garbage collection, etc.

Meanwhile, the less obstructed and less populated lands to the south or left bank of the Pasig river would be regarded as the ¨periphery¨ of the city- not only by the fortified ¨city¨ of Intramuros but to the booming settlements across the river. In an epoch where diseases and sanitary problems were considered to be aggravated by congestion and massing of noxious airs, these lands became the government´s escape from spaces that were believed to be public health risks. The tide of urbanization and densification coupled by the waves of epidemics that swept Manila in the late eighteenth to the nineteenth century converted the city´s arrabales as foci of infection. The increasing agglomeration of peoples in streets and public spaces, the overcrowding of dwellings, the lack of structures and means of the disposal of the dead, the limited supply of clean safe water, and the insecurity of food provisioning for all inhabitants posed serious hygienic and health risks to the capital. It in these contexts that the sanitary public works projects in

[72] Bayly (2005), p. 11.

the capital were deemed necessary and urgent. Some of these infrastructure plans included the laying out of hygienic, ordered, and illuminated streets and public spaces; the construction and distribution of clean piped water; the improvement of structures involved in food provisioning such as the slaughterhouses and markets; and the sanitary burial of the city´s dead.

Finally, the expansion of the colonial bureaucracy and the introduction of new professional groups of techno-scientific experts and medico-sanitary personnel opened for the incorporation of more criollos, mestizos, and eventually native Filipinos. In the field of engineering, the IGOP became a training ground for Filipinos. In the field of science and medicine, the *Facultad de Medicina, Cirugia, and Farmacia* which in the late nineteenth century provided additional manpower to the pool of colonial health and sanitary institutions and more articulators of new ideas on knowledge on illnesses, public health, and hygiene. More importantly, these institutions produced the first Filipino doctors and health professionals.

PART II

Case Studies: Analyzing Select Public Works Projects

The second part of the dissertation brings to the fore specific public works projects that were carried out in Manila in the late eighteenth to the nineteenth century. The succeeding four chapters will discuss modernizing infrastructure ventures that include: the street and urban layout projects of paving, naming, numbering, aligning, widening, cleaning, clearing, lighting, and embellishing the streets, public spaces, and thoroughfares; the establishment of the first waterworks network of the city and the initial attempts of sewage disposal; the construction of infrastructures designed to improve and regulate the food provisioning set-up of the city through the markets and slaughterhouses; and finally, the institution of urban general cemeteries for the hygienic disposal of the dead.

As previously mentioned, the selection of these infrastructure works was made based on the envisioned emphasis of the research and the availability of archival sources and existing literature. The abovementioned novel public works and infrastructures lie within the intended focus of this research which is sanitation and order. These public works projects were conceived, designed, constructed, and regulated to respond to the city´s problems of insalubrity, hygiene, order, and control as it evolved towards heightened urbanization. Yet, these were not simple physical infrastructures, rather, they carried symbolisms and representations wherein Spanish imperial vision and policy of a modern and rational colony could be examined, the emerging ideas concerning public health and control could be analyzed, and the changing conceptions of power and governability could be explored.

CHAPTER 4

Las calles públicas: Sanitizing, Ordering, and Controlling the Streets of the Capital

¨la inmundicia y la desigualdad de las calles…
la presencia de las aguas estancadas
que todo perjudica a la salud, ofende a los sentidos
y causa otros muchos daños al público¨[1]

the filth and roughness of the streets…
[and] the presence of stagnant waters
that endanger the health, offend the senses,
and cause many other damages to the public¨

On 21 June 1878, the primary streets of Dilao were bustling with people. It was the market day of the barrio- the roads filled with people scrambling, with vendors and their makeshift stores, and farm animals all over the place. At about ten o'clock in the morning, a group of men, shouting with their agitated voices, began running and rushing through the most public streets of the barrio of Paco. The cause of the uproar was unclear. What was certain, however, was the disruption and disorder that soon surrounded the streets. Upon hearing the ongoing commotion, the captain of the *Guardia Civil Veterana*, Juan Tacuray, commanded the urban police to ascertain what transpired and to restore order on the streets. Two and a half hours after sending out troops to different directions of the arrabal, five men were apprehended by the authorities. Ciriaco Nicolás, Francisco Moral, Ciriaco Medina, José Gerónimo, and Tomás Villanueva were identified as the principal instigators of the ¨alboroto¨ or disturbance. They were arrested and subjected to penalties for disturbing the peace and public order on public streets and spaces.

According to the report of the urban police, the incident caused trouble and chaos not only among market goers and bystanders but also among animals in the area. People were aimlessly rushing and screaming indiscriminately while animals were left wandering loose the streets. Ten uncontrollable carabaos and wild bulls ravaged the other principal and busy streets of Paco leaving behind damages to people, to the street, and to other public and private properties. The *Guardia Civil Veterana* reports did not provide the viewpoint of the accused men. No information was given why they staged the disturbance. Suffice it to say, the authorities punished them in the belief that they violated the regulations with regard appropriate

[1] AGI, Filipinas, 692, Bando de Buen Gobierno de 23 noviembre 1787, Manila, 23 noviembre 1787.

behavior on public streets and plazas- as ¨perpetrators of street disorder which alarmed the public and damaged the major part of the arrabal¨.[2]

According to Jane Jacos, ¨streets and sidewalks are the main public places of a city, and in fact, the city´s most vital organs¨[3]. Streets and sidewalks were an important part of the colonialist´s urbanism project in the colonies. As towns and cities evolved, perhaps roads, streets, and sidewalks could be considered some of the most basic public works projects. Laying out the streets, paving and constructing them, aligning and widening them, and maintaining their order characterized the late eighteenth and nineteenth-century Manila. As public spaces, streets and sidewalks are crucial in our understanding of the politics of public space since ¨their proliferation is contemporaneous with the governance of colonial empires[4]¨.

The June 1878 Paco incident is just one of the many cases that reflect that the colonialist´s idea of a rational and orderly city was not only limited to the carrying out of projects intended for street construction, pavement, and reforms. Consequently, the street was transformed into a space governed by a network of decrees, instructions, and norms that reflected the colonial framework of a rational city. This chapter demonstrates how Manila, through its streets, was constructed, designed and (re)organized by the Spanish authorities to fit according to their notions of a sanitized, orderly, and controllable city during the latter years of the eighteenth to the nineteenth century. It narrates how Manila´s streets were paved, constructed, organized, named, widened, and aligned; how they were cleaned and cleared; and lighted and beautified—all following the ideas of hygiene and ornate, security and order, and social control. However, planning and reforming the city not only encompass the physical construction of street infrastructures. It also involved the regulation and control of the habits and behavior of the population. The promulgation of urban decrees and laws by the colonial government outlined the colonizer´s standards of acceptable conduct and permissible activities in the use of streets and public spaces.

Following the idea that the colonial city is a ¨contested terrain¨[5], this research trails the story of Manila´s colonial street as a center of the colonial built environment and interrogates this space as a site of control and contention. Studies have portrayed streets as ¨terrains of

[2] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7664, Informe del capitán de la Guardia Civil Veterana Juan Tacuray, 21 de junio de 1878.
[3] Jane Jacos, *The Death and Life of Great American Cities*. New York: Vintage Books, 1961, p. 29.
[4] Anette Kim, ¨A History of Messiness: Order and Resilience on the Sidewalks of Ho Chi Minh City¨ in Chalana Manish and Jeffrey Hou, *Messy Urbanism: Understanding the ¨Other¨ Cities of Asia* (Hongkong, Hong Kong University Press, 2016), p. 25.
[5] Yeoh (2003), p. 9.

encounters and sites of domination and resistance¨[6]. This study navigates the street as a specific place where the interplay of colonial relations and policies could be interrogated. However, retrieving the agency of the everyday communities is a challenge due to the limitations of primary accounts. For this chapter, much of what we see and hear from the ordinary residents of Manila were their cases of violations. Nevertheless, these cases could be utilized to what Barnes call ¨ a *history of meaning,* an approach wherein ideas and values gain meaning not by being articulated in the abstract but by being grounded and enacted in specific local practices and social relations¨.[7]

This chapter primarily utilizes archival documents from the Archivo General de Indias (AGI), Archivo Histórico Nacional (AHN), and the National Archives of the Philippines (here referred to as Archivo de Filipinas or AF). The earlier documents in the late eighteenth century Manila pertaining to decrees on urbanity and civility are housed in the AGI, such as the early *bando de buen gobierno* of 1787, the three *bandos de buen gobierno* in 1794 during Governor General Rafael María Aguilar´s rule followed by the 1826 order under Governor General Mariano Ricafort. These urban edicts and decrees, followed by the *Disposiciones sobre policía urbana, ornato y demás servicios* promulgated by the *Corregimiento de Manila* and published in 1867, persisted until the nineteenth century as problems of sanitation and order continued to plague the streets and public spaces of the colonial capital. Meanwhile, the Archivo Histórico Nacional, specifically the *Fomento de Filipinas* section provides abundant documents, maps, and plans on the numerous public works projects related to street construction and improvement in the nineteenth century-projects which included new street layout, street cleaning and clearing as well as street embellishment. However, these documents tend to highlight only the bureaucratic and colonial worldview of the Spanish administrators and officials. Complementary to these documents are the sources available in the National Archives of the Philippines which enrich our knowledge and understanding on how the locals perceived and reacted to these decrees and projects.

[6] Nicholas Fyfe, *Images of the Street: Planning, Identifying, and Control in Public Space* (London and New York, Routledge, 1998,) p.1.
[7] David S. Barnes, *The Great Stink of Paris and the Nineteenth-Century Struggle* (Baltimore, Johns Hopskins University Press, 2006 2006), p. 5-6.

A. The Decrees of Good Governance *(Bandos de Buen Gobierno)* and the Colonial State´s Police Arm

The late eighteenth to the nineteenth century witnessed an increased social control on the streets of the colony´s capital. The period was characterized by what Pedro Fraile´s call the period of *policy science,* an epoch wherein mechanisms of vigilance and control on the quotidian aspect were institutionalized.[8] These techniques of surveillance implied the ¨intervention on the daily life of individuals and, consequently, the government paid attention to small details, as instrument to shape the habits and attitudes of the citizens¨.[9]

The eighteenth century to the nineteenth century was reflective of this period of *policy science* as characterized by a series of *reglamentos, decretos* and *bandos de buen gobierno* promulgated by the colonial government that envisioned urban order and civility. In the seventeenth and early eighteenth century, several *bandos de buen gobierno* were also proclaimed. However, these were more general nature and directed to the colonial administration of the archipelago in general. By the second half of the eighteenth century, more *bandos de buen gobierno* would be promulgated for the specific implementation in Manila, the colonial capital.

Heralded by the ideas of ¨good governance and public ornate¨ (*buen gobierno y ornato público*), the Spanish colonial administration in the Philippines designed a set of laws and regulations that would usher in colonial modernity to the islands. In the Philippines, decrees were issued to introduce Bourbon reforms to address the multi-faceted challenges of an urbanizing colonial capital. De Viana cited that the *Fábrica de Tabacos* in Binondo, the first formal factory system in the Philippines brought by the economic tobacco reforms introduced by Governor General José Basco, was a manifestation of this increasing urbanization. Thousands of men and women from nearby towns and provinces were gravitated towards the arrabals of Binondo, Tondo, as well as the nearby Santa Cruz and Quiapo.[10] The increase and spread of economic activity in the different parts outside the walls of Intramuros coupled with a demographic growth signaled the need for the establishment of rules and regulations aimed at controlling the activities and behavior of urban residents.

Generally called *bandos de buen gobierno,* the decrees took the form of control over the capital´s residents to combat the physical and moral disorderliness that they seemingly

[8] Fraile (May 1998), pp. 29-30.
[9] Ibid. (1997), p. 130.
[10] Lico and De Viana (2016), p. 9.

generated. These forms of control were primarily measures of public sanitation, order, and ornate not only for the general population but more notably for the ¨undesirable¨ segments of the colonial society. For instance, the decrees underscored the need to identify, document and control the detrimental colonial subjects- the idlers, vagrants, undesirables (*ociosos, vagos, malentretenidos)* through a stricter implementation of the registration system (*empadronamiento)*. They had to be ordered because they were commonly associated with unproductive behavior *(vagrancy)* and undesirable activities such as gambling (*juegos de gallos, juegos de naipes, juegos de dados*), drinking, and petty crimes. Moreover, colonial officials were concerned that their habit of roaming the streets generated dirt and filth in public spaces and triggered chaos and disarray in the city streets. These instructions also gave attention to the street as a governable space. They intended to normalize activities related to the city´s hygiene and order, especially with regard street cleanliness and maintenance.

An example of a *bando de buen gobierno* was published in November 1787 when Ciriaco González Carvajal, then judge (*oidor*) of the Real Audiencia proclaimed a set of rules for the good governance of the capital and its arrabals (*bandos para el buen gobierno para esta capital y sus arrabales de noviembre 1787*). However, it is arguable that the more intensive, extensive, and impactful promulgation of *bandos de buen gobierno* could be attributed during Gov. Gen. Rafael María Aguilar´s rule (1793-1806). Aguilar´s administration was characterized by a series of sanitation and beautification efforts in the capital driven by the Enlightenment reforms in the latter part of eighteenth-century Spain and Europe. During his rule, at least three decrees were circulated in the capital- the *bando de buen gobierno* of 21 March 1794 with two supplementary instructions published on 2 May 1794 and on 11 September of 1794. The decrees consisted of a wide-ranging set of urban rules and regulations that controlled the social life and activities of urban residents around the streets and public spaces and imposed restraint on even the most mundane, small-scale, and ordinary aspects of urban life. A prescriptive daily routine was enforced in the assumption that on the premise that this could become ingrained in the day-to-day habit and code of the people.

The 1787 and 1794 bandos de buen gobierno

In 1787, the colonial state after having noticed ¨the filth and roughness of the streets… [and] the presence of stagnant waters that endanger the health, offend the senses, and cause many other damages to the public¨*(la inmundicia y la desigualdad de las calles…la presencia*

de las aguas estancadas que todo perjudica a la salud, ofende a los sentidos y causa otros muchos daños al público),[11] proclaimed regulations aimed at maintaining the cleanliness, salubrity, and order of the public streets, thoroughfares, plazas, and public spaces of the capital. Officials were primarily alarmed with the state of Manila´s streets—unpaved, neglected, and surrounded by stagnant foul waters, putrid human and animal excrement, and all kinds of decomposing garbage and putrefaction. The authorities warned that this did not only cause harm to the public health but also emit a disgusting portrait to the visual and olfactory sense of a capital city. To address these sanitation problems, the 1787 *bando de buen gobierno* was published.

This early 1787 *bando de buen gobierno,* albeit poorly-structured, provide a glimpse of the authorities´ view on the capital´s principal sanitation threats and how to solve the problem of hygiene and order on the city´s streets and public spaces. The primary threats were the following: stray animals, and unsanitary residents of the capital, and vagrants. The municipal authorities were resolute. All animals found to be roaming the streets three days after the publication of the order would be killed. Throwing or leaving dead animals on streets and plazas was severely punished. The penalty for this offense was revealing of the colonial authorities´ view. It varied from a fine of 5 pesos to flogging and imprisonment for poor individuals who could not pay the amount. Moreover, this punishment was not only for individuals who would commit the act but was also extended to the house owners nearest to the place where the dead animal was disposed. This conveyed the message that street sanitation was a neighborhood enterprise. Meanwhile, unhygienic residents of the capital were also apprehended. Imprisonment or public flogging await the individuals caught littering and throwing dirty water and excrement in the streets and public thoroughfares. For the colonial authorities, health and hygiene begin not only on the streets but in the private confines of houses therefore ordering that ¨all houses should have latrines; houses without latrines are prohibited to throw their excrement, urine and other waste on the street¨. Houses with sewers were told to cover the pipes that directly extend to the street with brick stones and repair any holes in the drains. Again, imprisonment, flogging, and a heavy fine await the offenders. Meanwhile, street vendors who put blankets (*tapancas*) that serve as shade to their stores (*tiendas*) were also apprehended. According to the colonial authorities, this practice causes disorder and impedes the free circulation of people and carriages in the streets. Furthermore, this also gives a sense of an unwarranted right of extending private properties thus minimizing sufficient safe space for the

[11] AGI, Filipinas, 692, Bando de Buen Gobierno de 23 noviembre 1787, Manila, 23 noviembre 1787.

public. This practice was abhorred by the municipal authorities as this results to irregular and unequal laying out of streets. Aside from ¨destroying¨ the ornate of the capital, these trappings also prevent air circulation causing filthy vapours that commonly cause stench and contagions to big populations. (*eviten la entrada libre a los vientos que se lleven y disipen los vapores inmundos que se originan en todas las poblaciones grandes y que suelen ser causa de pestes y contagios*.) Finally, census-gathering was intensified as vagrants, unemployed, and undocumented individuals were considered threats to public order and hygiene. According to colonial authorities, these undocumented individuals who ¨typically loiter in every sidewalk and corner of Tondo, Binondo, Santa Cruz, Quiapo, San Sebastian, Parian, Arroceros, San Antón, Dilao, San Miguel, Ermita, and Malate¨ and ¨commonly involved in illegal gambling on the streets¨ needed documentation and strengthened control. Furthermore, residents were prohibited from transferring from one barrio to the other without permission or consent from their respective *alcalde.* [12]

It can be argued that the 1787 edict became the blueprint of Governor General Rafael Maria de Aguilar´s heightened campaign on improving the physical state of the streets as well as regulating activities related to public space towards the end of the century. As already mentioned, testament to the intensity of the campaign was the proclamation of three urban decrees of 21 March 1794, 2 May 1794, and 11 September 1794 that could be considered better-structured and more target-specific than the 1787 decree. María de Aguilar´s first 1794 decree had this preamble:

> ¨The main foundation of the happiness and security of the peoples are **the good rules and regulations** that prevent the ills and abuses from which people suffer and the harmful experiences brought about by custom or tolerance¨[13]
>
> *¨El principal fundamento de la felicidad y seguridad de los pueblos son **las buenas reglas de policía** que eviten los males y abusos de que adolecen y con particularidad aquellos que la experiencia ha hecho conocer están más arraigados por una envejecida costumbre o tolerancia perjudicial ¨*

Standing on this philosophy that good rules and regulations could transform colonial subjects into lawful, orderly, and hygienic subordinates, the 1794 series of decrees and edicts enumerated the acceptable behaviour and activities that guided the urban life of Manila´s

[12] AGI, Filipinas, 692, Bando de Buen Gobierno de 23 noviembre 1787, Manila, 23 noviembre 1787.
[13] AGI, Filipinas, 366, Bando de Buen Gobierno de 21 marzo de 1794, Manila, 21 marzo de 1794.

residents. But how were the 1794 decrees distinct from the 1787 decree? *First*, the 1794 decrees´ arm of control were wider in scope and reach as compared to the 1787 predecessor. The 21 March 1794 regulation contained thirty-nine articles while the 9 March 1794 and 11 September 1794 regulations consisted of twelve and thirteen articles respectively. These articles were no longer limited to controlling the movement of unsanitary residents, undocumented vagrants, and stray animals. The 1794 decrees encompassed rules from zoning to census-gathering, sanitation and hygiene to morality and civility, to almost all aspects of urban quotidian living. S*econd*, the articles convey a sense of specificity and precision on how to go about the rules and instructions. An order that public spaces should be maintained clean and clear was not enough. Thus, the colonial authorities imposed *defined* guidelines on the cleaning and washing of front yards and streets. A routine for the residents was obligatory, specifying the hours and stations of the year when residents should comply to this order. For example, the citizens were instructed to go out of their houses every day from 7:00 o´clock to 8:00 o´clock in the morning and 5:00 o´clock in the afternoon to perform the task. Stricter measures were imposed especially during the dry season from March to May. The repetitive intervention on the daily routine of the inhabitants was in line with the idea of ¨shaping rational and hygienic¨ colonized subjects. *Third*, the decrees provided a more nuanced characterization of the offense and somehow envisioned that one of the causes of Manila´s filth and disorderliness could be converted as part of the solution. First and second offenders were apprehended maintaining, however, that the goal is to achieve the public´s compliance to the urban rules. If not, the offenders were to be utilized in the public works projects of the colonial state. For instance, failure to maintain clean front yards and streets, a two-peso fine was imposed on first-time offenders, while second and third time violators were fined four pesos and fifty pesos respectively. Meanwhile, repeat offenders, recalcitrant vagrants, and prisoners were converted as labor manpower in the public works project of the government, such as street construction and repair.

Certain behaviors and activities in the street were prohibited and regulated according to the colonial framework of urbanity and control. For example, unregulated street markets (*baratillos*) were banned since according to the colonial government the congregation of people in public streets impeded public transit and the streets became main sites of petty crimes such as theft and trickery. Hawkers or ambulance vendors selling betel nut (*buyo)* and other goods were considered undesirable and they were thus fined of two pesos up to four days of imprisonment. These decrees were also envisioned to impose norms in the public and private

sphere of Manila and its environment. For instance, decrees pertaining to public noise, good conduct, nudity and immoral behavior were implemented. The supposed disorder brought by the darkness of the night was deterred through the imposition of curfews. Even the most mundane habits of the natives that contradict the colonizer´s sense of urbanity were regulated. Natives, for instance, were prohibited from idling or taking a bath in the streets. Throwing dirty water on the street was also banned. To sum, the decrees intended to enforce order on what was increasingly perceived as unruly social and spatial situations. [14]

The street was a confrontation site for the sanitary reform movement. Reformers battled not only against filth, contamination, and insalubrity but also against immorality and disorder. As consequence, the urban norms and regulations also stressed that modern, clean, and healthy streets meant of streets free from nudity, vulgarity, immorality, and criminality. For instance, the decree on 14 April 1826 paid more attention in policing the streets of the capital against vagrancy, street gambling, and petty crimes. [15]

The 1867 Regulations

A modern colony characterized by a sanitary and hygienic capital seemed to be a distant aspiration even until the second half of the nineteenth century. Chaos, disorder, contamination, and filth continued to depict the streets and public places of Manila. In 1867, the highest authorities in the colony called the urgent attention of the municipal authorities of Manila to ¨report all stagnant water deposits or corrupt materials in the city, [to] impose on all residents the obligation to throw their garbage as far away from the public streets frequented by public transit [and to] be responsible in the upkeep of the streets keeping them free from grass, obstacles, and filth. ¨[16] The preoccupation of the colonial government to observe sanitation and order on the streets became more pronounced and striking as reflected by the publication in 1867 of the *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila* which compiled, revitalized and expanded the existing norms while adding new urban rules in the capital. It is composed of the different old and new rules and regulations with regard the sanitation and ornate of public streets (*Disposiciones relativas a la*

[14] The most significant decrees were the Bando de Buen Gobierno de 23 noviembre 1787, 21 marzo de 1794, 2 mayo de 1794, 14 de abril de 1826, Disposiciones sobre policía urbana, ornato y demás servicios de 1867.
[15] AGI, Ultramar, 515, Reglamento para Establecer la Comisión de Policía, ordenada con acuerdo de la Real Audiencia de las Islas Filipinas, por su presidente el Excelentísimo Señor Don Mariano Ricafort, Gobernador y Capitán General, Superintendente General Subdelegado de Real Hacienda de las Mismas, Impreso en la Imprenta de Sampaloc, Año de 1826.
[16] *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila* (Manila, Estab. Tipográfico Amigos del País, 1867), p. 6.

limpieza de las calles y plazas) published in 1823, instructions pertaining to the proper zoning and construction of houses (*Disposiciones relativas a la edificación y ornato),* the use of carriages and horses in public spaces and thoroughfares (*Disposiciones relativas al tránsito de carruajes, carrros, caballos y demás animales por las calles*) also decreed in 1823, and the 1866 decrees on the bounds and limitations of the loaders who work in the streets of the capital (*Disposiciones relativas a los que ejercen el oficio de cargadores*), and the general ruling on carrying out road works in Manila (*Reglamento para las obras públicas del distrito municipal*). Visible in all these decrees was the heightened presence and intensified function of the urban police in the implementation of these rules.

Essentially, the *Disposiciones relativas a la limpieza de las calles y plazas* first published in 1823 only reflected the basic principles of sanitation regulation imposed during the late eighteenth century. Most of the specific instructions were actually reminiscent of the earlier guidelines of the colonial government. However, it can be argued that the edict reflected the attempts of the colonial government to introduce nineteenth century modernity ideas of urban sanitation and hygiene and control of the quotidian activities of the city´s inhabitants. For instance, the colonial government opened contracts to private individuals who were ready to provide the service of garbage collection and maintaining the streets of the capital clean. Intramuros and the richer suburbs of Binondo, Santa Cruz, and Quiapo were the first ones to avail of this public-private sanitation service. However, the colonial government emphasized that maintaining the cleanliness of streets and public spaces were still primary civic duties of all residents regardless of class *¨todos los vecinos, sin distinción de clase¨*.[17] Therefore, the residents with hired garbage collection services were still obliged to observe the proper disposal of waste at the designated time of the day. Meanwhile, the residents of the remaining arrabals without this service were prohibited to pile household garbage in front of houses and were required to individually dispose of their waste in proper areas designated by the municipal government. Moreover, the dumping of night soil and remains of dead animals in streets and public spaces were strictly prohibited. The colonial government reiterated that these pollutants should be disposed in areas far from the residents´ houses. Monitoring and surveillance is key to the effective control of the inhabitants´ quotidian sanitary habits. Surveillance forces, such as community inspectors and urban police, were tasked to inspect the cleanliness of streets and front yards of houses every day from 10:00 o´clock in the morning. The performance of the

[17] *Disposiciones relativas a la limpieza de las calles y plazas, 1823* In *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila,* 1867, p. 9.

garbage collection and street maintenance contractors was also placed under the scrutiny of these surveillance and inspection officers.

The municipal government also paid attention to the laying out of zones in the capital and the minimum requirements in the construction of houses in Intramuros and the arrabals as dictated in the *Disposiciones relativas a la edificación y ornato.* Ideally, these zones demarcated the construction and building code and regulations in the capital. To prevent massive destruction especially from fires and earthquakes, the colonial government identified areas and streets that were exclusive for the construction of houses and buildings made of heavy construction materials (*caserío de piedra*). In effect, the use of light building materials such as *caña, nipa,* and *cogon* were prohibited in these zones. Moreover, the colonial government also attempted to regulate the architectural design and layout of houses and buildings, imposing a minimum height of 13 to 15 ft. and a considerable distance of 6 to 12 yards from the street and/or esteros. For the colonial government, the good physical appearance of the houses and their façade is part of the over-all street sanitation and beautification. Thus, municipal officials decreed that all property owners of houses and buildings should clean and paint their estates from ¨filth that present a bad image¨. Although not a requisite, property owners were also encouraged to construct fences not only ¨to present a good physical aspect¨ of the structures but also to ¨complement to the alignment and layout of streets¨.[18] In this decree sidewalks became a heavily nuanced space that became an important component of the categorization of public and private spaces. The decree stated that house owners were required to put sidewalks and repair them if necessary. The municipal government suggested that sidewalks should be paved using China stone (*piedra de China*) brick, mortar, and cement. The authorities however banned the use of sidewalks to erect small shops for the selling of different products, unless otherwise initiated by the Ayuntamiento. Part of the organization of the city was the decree that all property owners were required to have their houses properly numbered with legible and nicely-written characters. This numbering technique as a control mechanism by the colonial government to its subjects was already introduced in the late eighteenth century but was more emphasized in the decrees in the nineteenth century. An image of modernity was evoked by the municipal government of Manila when all houses and buildings were required to incorporate sanitation infrastructures, most specifically indoor kitchen, latrines, and sewers, ¨so that dirty water and other matter do not have a way out of the street thus avoiding the current disgusting aspect of many streets in the capital for having neglected this very important sanitation

[18] *Disposiciones relativas a la edificación y ornato 1823* In *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila,* 1867, p 16.

precaution¨.[19] The domestic chores of cooking, cleaning and bathing were prohibited in the streets and public spaces. Similar to the other urban regulations, the municipal government invoked the surveillance mechanism of the urban police and the *gobernadorcillo* under the *Señor Regidor Inspector* of the different districts in the capital.

In its attempt to clear the streets and put order in public spaces, the colonial government implemented several mechanisms to control street traffic, mobility, and circulation as reflected in the (*Disposiciones relativas al tránsito de carruajes, carros, caballos y demás animales por las calles de esta ciudad*). For the municipal authorities, the need to establish regulations pertaining to the flow of street carriages (*carruajes*) and carts (*carromatas, carretones*) as well as the presence and movement of animals was crucial in establishing order in the capital. As in any other *bandos de buen gobierno*, it is undeniable that the techniques of identification, registration and profiling were put in place in this decree to further enhance the controlling mechanism of the colonial government in implementing urban rules and regulations. All carriages with two to four wheels should be properly identified, registered, and documented to obtain a license to circulate the city. The license should clearly document the vehicle number, the type of vehicle (*carruaje, carromata, carreton*) and the name of its owner and the driver. All vehicles used for public transportation should follow the registered routes and the established pick-up points and travel schedule. Meanwhile, vehicles used for transporting goods and other products were not permitted to circulate at night. All transportation of products should be done at day time for the authorities´ vigilance and control. A speed limit was supposed to be observed among these street vehicles, albeit not specified nor defined. It was however clear that these vehicles should not go beyond the sidewalks safety to prevent ¨damages or inconvenience to the passers-by¨ (*daños o molestias a los transeúntes*).[20] For security purposes, even the size of the tires was regulated and should be 1 ½ to 1 ¼ inch in width. A unified tariff rate was imposed for every hour a *carruaje, calesa,* and *carromata* was rented, the *carruaje* being the the most expensive and the *carromata* being the cheapest as seen in Table 1.

[19] Ibid.
[20] *Disposiciones relativas al tránsito de carruajes, carros, caballos y demás animales por las calles de esta ciudad, 1823* in *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila,* 1867, p. 21.

Time	Carruaje	Calesa	Carromata
For every half an hour	2 reales	1 real	15 centavos
For every hour	4 reales	2 reales	1 real and 10 centavos
For every six consecutive hours	1 peso and 4 reales	6 reales	4 reales and 10 centavos
For every twelve hours	3 pesos	1 peso and 4 reales	1 peso and 1 real

Table 1: Tariff for the use of carriages and carts in Manila
Source: Disposiciones relativas al tránsito de carruajes, carros, caballos y demás animales por las calles de esta ciudad, 1823.

Meanwhile, the drivers and owners of these street vehicles were also obliged to be registered and profiled. Registration documents with details of domicile (*empadronamiento*) were required from them. This documentation technique was the colonial authorities´ mechanism to control those engaged in street circulation and mobility. Aside from proper identification and registration, appropriate conduct was also expected especially among the carriage drivers. According to the decree, all drivers should not be less than 18 years old. They were expected to constantly monitor their speed limit while circulating the streets, follow the rules while moving around, and maintain that the animal (horse or carabao) and the vehicle itself do not impede street order and flow.

In 1885, the municipal authorities in Manila amended this decree and added some specific instructions in the *Reglamento del Uso de Carruajes* published in the Gaceta de Manila.[21] These additional rules practically impose more stringent profiling and registering of street carriages and the regulation of conduct and behavior of carriage drivers as a technique to control the street as a public space and to evoke modernity. For example, carriages needed to be decent, clean, well-maintained, and equipped with a hood, lamps, seat cushion, carpet, and sunblind (*trapal*). Old, broken, and worn-out carriages were also prohibited to circulate the city. More importantly, the horses and other animals used in the vehicle should be healthy, properly groomed and maintained, and provided with necessary accessories such as muzzle. Meanwhile, to portray modernity and to ¨professionalize the work¨, drivers of carriages should not only be well-behaved but also be properly groomed. *Carromateros* (drivers of wagons pulled by carabaos) as well as carriage drivers were obliged to wear a *guingon*[22] pants and *camisa de*

[21] "Reglamento del uso de carruajes," *Gaceta de Manila*, año XXV, número 10, 2 de mayo de 1885.
[22] Blue cotton cloth

rayadillo[23], rubber cap with a blue stripe and printed with the text ¨*Servicio Público*¨. They were expected to wear clean clothes every day. More measures of control in their conduct were imposed as sleeping inside the carriage, letting loose and washing of horses and carabaos in public streets, wearing of improper clothes, and leaving the carriages and wagons in undesignated places were considered street infractions by the colonial government.

Furthermore, clearing the streets from abandoned and stray animals was also a subject of concern for colonial authorities and urban reformers. For them, these roaming animals not only create disorder in street circulation but also pose hygienic and sanitation problems for the capital. As consequence, several decrees pertaining to stray animals were promulgated such as the *Disposiciones relativas al tránsito de caballos y demás animales por las calles de esta ciudad.* These regulations primarily prohibit animal owners from letting their horses, carabaos, pigs, goats, chickens, and other animals roam the streets and public spaces nor the tying of these animals in these communal spaces.[24] Horses and carabaos used in the transportation vehicles should have proper ropes and halters. Meanwhile, animals such as pigs, goats, chicken, etc., intended for domestic use should be kept in enclosed pens or stables. If these animals need to be moved from one place to another through streets and public spaces, they should be properly tied and managed to avoid public disturbance. Otherwise, all stray and loose animals encountered by the urban police roaming the streets were to be detained. After three days, all stray animals that were unclaimed by animal owners were to be considered confiscated. Pigs, goats, and sheeps were to be donated to feed individuals housed in charitable establishments (*establecimientos de beneficiencia*) such as hospices and hospitals or to the prisons. Archival documents show that the Hospicio de San Jose and the Bilibid prison most benefitted from these seized animals. On the other hand, detained horses, carabaos, and cows were subject to public auction. Ideally, all proceeds from these auctions should also be channeled to the various charitable institutions in the capital. The colonial authorities paid particular attention to the dogs and other animals of prey. They were to be allowed on streets and public spaces only in very specific instances and should be kept securely tied and muzzled. To the eyes of the authorities, all animals without these accessories were to be considered stray dogs or ¨*perros vagamundos*¨. For horses, over speeding was strictly prohibited on the streets as it ¨cause inconvenience and risk to people on foot¨. According to the regulations, fast carriages could only traverse on unpopulated streets. Animals owners were to be fined for every infraction of these guidelines.

[23] Blue-and-white striped shirt
[24] *Disposiciones relativas al tránsito de caballos y demás animales por las calles de esta ciudad* en *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila,* 1867, p. 27-29.

Street control was also applied to the loaders or *cargadores* that circulate the streets of capital to deliver goods.[25] The bustling nineteenth century state of the capital meant an increase in the number of loaders that formed part in the economic activities of the city. Similar to the carriage drivers, the technique of profiling and documenting the cargadores was crucial to effectively control them and their activities. All cargadores were required to be documented and identified in alphabetical order with their corresponding domicile (*empadronamiento*), guild (*gremio*) and filiation in the urban police´s book of register (*libro de registro*). Misconduct such as repeated drunkenness, quarrelsome carácter and any similar behaviour were grounds for the suspension of a cargador´s license to perform his job. The cargadores, who were mostly native *indios* and chinos, were required to obtain a license to work by submitting a certification of good character from the *cabeza de barangay* or *gremio de chinos sangleyes* respectively. Badges indicating the cargador´s registration number were to be expedited to all licensed cargadores which should always be worn for proper identification. These badges were non-transferrable. Individuals performing this job without the colonial authorities' proper identification and registration were fined. A uniform tariff was established for service that they rendered**.**

Moreover, a general set of rules were also promulgated as guide to the resident´s overall behavior amidst the increasing changes of the urban life. The colonial authorities also looked at the plight of houses for rent, ensured their cleanliness and sanitation as reports came that these ¨houses emit smoke and bad odor that are therefore harmful to public health¨ (*produce en ellas humo u olores malos y por lo tanto perjudiciales a la salud pública*). For instance, the cramped dwellings of Chinese and *indio* natives in houses for rent in Binondo was pointed out by sanitation reformers in Manila. In 1858, it was recorded that the suburb of Binondo alone had 1,310 houses for rent that were situated on the streets of San Fernando (245 houses), Rosario (193 houses), Sto. Cristo (110 houses), and San Jacinto (102 houses).[26] Moreover, overcrowding was not only limited in houses or lodging quarters for rent but also in normal households reached the attention of the colonial government. In its attempt to regulate housing, the colonial government ideally set on paper that lodging quarters should at least provide 40 sq. ft. for one person; thus a 200-ft. room should not exceed the capacity of five individuals. For the colonial authorities, the cramped living conditions of the residents of the capital did not only pose threat to the city´s order but more importantly to the public health and safety of the

[25] *Disposiciones relativas a los que ejercen el oficio de cargadores* en *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila,* 1867, p.51-55.
[26] *Comisión Central Estadística de Filipinas,* 20 Cuaderno (Manila: Imprenta de Boletin, 1858).

people.[27] Furthermore, activities and behavior viewed to disturb public order and sight were also identified and prohibited. For instance, excessive noise from gathering was prohibited specially at night. Playing street games such as *sipan* (sipa) or other ball games and the use of firecrackers (*reventadores and buscapiés*) were also banned on public streets and plazas. Although separate regulations were promulgated to tackle vagrancy, the colonial government still underscored that loitering on public streets was prohibited. Finally, the colonial authorities banned the ¨repugnant and even immoral¨ custom of natives and Chinese of public bathing, exposing their bodies on streets and plazas. These decrees would be replicated several times and as problems of hygiene and sanitation persisted in the colony for the rest of the nineteenth century.

Furthermore, the 1867 decree included the *Reglamento para las obras públicas de distrito municipal* which outlined the rules in carrying out projects related to street construction and improvement. For purposes of street public works projects, the municipal government divided the capital into four divisions. The first division included the streets of Intramuros and the streets to the right of the Pasig river leading to the Paco Cemetery. The second division comprised of the arrabals of Tondo and Binondo; the third is composed of the arrabals of Santa Cruz, Quiapo, and San Jose; while San Miguel and Sampaloc belonged to the fourth division. The *Reglamento* specified the responsibilities of the municipal arquitect, inspector, foreman, and labourers involved in the public works project. Basically, the architect´s primary role is divided into two: to supervise and review that the plan and materials needed in the reparation and maintenance of road works were in good state and to oversee the performance of the *polistas* and labourers in the public works project. Meanwhile, inspector is expected to inspect the day-to-day execution of the road works. It is important to emphasize however that the bigger part of the *Reglamento* was intended for the enforcement of the rules among the *polistas* and other labourers. A detailed list of the *polistas*, their names, address, guild should be prepared. This list included the number of days that a *polista* rendered service. The number of *polista* for every working day should be twenty. If not, the inspector is tasked to hire *indios, mestizos,* or Chinese workers to cover the necessary manpower. The daily compensation of non-*polistas* according to the municipal government should not exceed 2 and ½ reales. Furthermore, prisoners in the capital were also expected to provide labor in the roads works. However, more stringent measures were applied to them. The prisoners who were sentenced to provide manpower in the public works projects should be properly identified and well-guarded by a

[27] *Disposiciones Generales*, p. 56.

foreman. They were also not to be mixed with the *polistas* and the other labourers to ensure security. All workers were required to work for 8 to 9 hours a day, beginning at 7:00 o´clock in the morning until 12:00 noon then from 2:00 o´clock in the afternoon until the sun sets at around 5:00 to 6:00 o´clock in the afternoon. According to the municipal government, all road works should be continued even during rainy days. The suspension of work, due to inclement weather, should be proposed and approved by the foreman and the municipal architect. At the end of a day´s work, all construction materials and equipment that were utilized by the labourers should be surrendered to the foreman.[28]

Vigilance and the urban police

For thorough dissemination and implementation, the *bandos* were printed in mass and distributed in all barrios, including the arrabales of Manila. Penalties and fines were imposed to ensure the wide compliance of the regulations. The observance of these rules and regulations depended on the vigilance strategies of the urban police. In the late eighteenth century, the *celadores* and the urban militia were tasked to closely regulate the streets and public places. The first decrees of Aguilar provided for the creation of a police arm for the observance of urban rules and regulations in Manila. However, it was during Gov. Gen. Mariano Ricafort´s administration that a Police Commission (*Comisión de Policía*) was established in 1826 to ¨banish any seductive idea aimed at disturbing public peach and to cut the idleness and disorder¨ (*desterrar toda idea seductora, dirigida a perturbar el sosiego público y cortar la holgazanería y desorden*). The police commission exercised the implementation of the *bandos de buen gobierno* in the capital and the growing provinces of Tondo and Cavite, focusing mainly on street patrolling to capture undocumented individuals, vagrants, and disturbers of the public´s tranquility.[29] By the second half of the nineteenth century, the police arm of the colonial government was intensified through the reorganization of the patrol forces and the creation of the *Guardia Civil Veterana.* Recognizing the inefficiency of its predecessor *Cuerpo de Vigilancia Pública* in keeping the city dwellers comply with the urban norms and regulations, a Royal Order on 6 April 1872 was promulgated creating the *Guardia Civil Veterana.*

[28] *Reglamento para las obras públicas de distrito municipal,* 4 de diciembre de 1866 in *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila,* 1867, pp. 64-66.
[29] AGI, ULTRAMAR 515, Reglamento para Establecer la Comisión de Policía, ordenada con acuerdo de la Real Audiencia de las Islas Filipinas, por su presidente el Excelentísimo Señor Don Mariano Ricafort, Gobernador y Capitán General, Superintendente General Subdelegado de Real Hacienda de las Mismas, Impreso en la Imprenta de Sampaloc, Año de 1826.

In order to cover Manila and its suburbs, the urban police arm had its headquarters in Gen. Crespo Street in the arrabal of Santa Cruz and was then subdivided into six districts each with its corresponding stations. These are (1) District of the walled city of Manila with its station at San Juan de Letran Street (2) District of Santa Cruz, Quiapo, and San Jose with its station at Enrile Street, Santa Cruz (3) District of Binondo and San Nicolás with its station at Joló Street, Binondo (4) District of Tondo with its station at Nueva Ilaya Street (5) District of Sampaloc, San Sebastian, and San Miguel with its station at San Anton Street, Sampaloc; and (6) District of Ermita, Malate, Paco, and Concepcion with its station at Nueva Street between the barrios of Paco and Malate.[30]

Surveillance and police activities comprised the principal tasks of the *Guardia Civil Veterana*. These included the maintenance of hygiene and order in markets, slaughterhouses, streets, and public spaces. They were also responsible in assuring that all rules with regard public cleanliness, public lighting were observed. The section was also tasked to regulate agglomeration in the housing condition of city dwellers and control that establishments deemed ¨dangerous and insalubrious¨ be situated in unpopulated areas. The urban police also controlled all ¨hazardous¨ activities such as burial of the dead. On the street, the *Guardia Civil Veterana* paid specific attention to the proper conduct of coachmen, the behavior of passers-by and pedestrians, and the general demeanor of citizens in public. Performing the task of urban police, they were assigned to ensure that the streets were in good condition-- clean, clear, unhindered, properly maintained, free from all forms of obstructions, and properly groomed and illuminated at night. Their tasks consist of maintaining cleanliness and order in public streets and spaces such as parks, roads, plazas, and other spaces where the city´s inhabitants commonly converge. In terms of maintaining the upkeep of the streets, they were responsible in arresting idlers, vagrants, gamblers, and those roving in the night as well as the detention of stray animals that cause disorder and insalubrity to public spaces. They were also tasked to report and apprehend traffic violators brought about by street wagons (*carruajes*) and ambulant vendors. They were expected to perform regular sanitary inspections on the streets and impose fines on residents who violate the rules on public hygiene.[31]

Part of the reorganization of the urban police was the establishment of reform measures to a more systematized and uniformed documentation and record-keeping of all urban infractions observed by the *Guardia Civil Veterana*. Standardized forms that served as ¨daily

[30] *Reglamento para la Guardia Civil Veterana,* Manila: s.n. 11 de junio de 1872.
[31] Ibid., p. 20-21.

reports¨ indicated the names of infractors, their profile, the urban norms and regulations that they committed, and the corresponding fine and punishment. These reports and records produced by the urban police, albeit incomplete and in poor state, provide us today with a glimpse on how Manila residents reacted and responded to the numerous urban laws and decrees that were implemented in the capital.

Throughout the late eighteenth to the nineteenth century, the urban norms and regulations were repetitively changed, amplified, and intensified. However, the opposition and resistance of the capital´s city dwellers to these laws were nevertheless as recurring as these changes.

B. Constructing and Paving the Streets

Street construction is considered one of the oldest innovations of man in city creation. As towns and cities grew, the need to improve the spaces where people traverse became imperative. In time, the street as a physical body and a physical space also evolved. Not only did the street construction techniques, design and configurations change but also the meaning and value that people attribute to it. One of the most important reforms that the municipal authorities carried out in cities was the pavement of streets. In colonial manila, it signalled an important change in the urban public works projects in the capital. Paving the street did not only translate to improved circulation but also to enhanced hygienic conditions of the city. Paved streets meant ¨isolating the dirt and the rottenness of the soil and preventing the presence of miasmas and the bad smell[32]¨ that emanate from the ground.

In the late eighteenth century, Gov. Gen. Rafael Maria Aguilar pushed for the urgent reforms in street pavement in colonial Manila. Primarily motivated by public health concerns and by the unpleasant image of a colonial capital, he lamented the miserable condition of the unpaved streets of the capital. He said,

> …since my arrival, I saw [in the streets] an accumulation of debris and filth, barely nevertheless of its magnitude there was transit both for wagons and people on foot. [The roads], however, were occupied by deformities, filled on the other side by vendors and their stands and animals of all species on the other, all forming a monstrous and unpleasant condition. [33]

[32] Alzate Echeverri (2006), p. 77.
[33] AGI, Estado, 46, No. 35, Gobernador de Filipinas sobre reformas de calles de Manila, Rafael María de Aguilar, 28 de febrero de 1797.

...desde mi llegada, un conjunto de vecinas de escombros y de inmundicia, a penas sin embargo de su magnitud había un tránsito como para los coches y gentes de a pie, ocupada con tales deformidades, llena por otra parte de mesillas indecentes de vendedores, y embarazada con animales de toda especie, así el campo como domésticos que pacían a su arbitrio formaban un agregado monstruoso y desagradable condición

Improving the streets and public spaces, even in the capital, was a rare occurrence only during important religious feasts, royal mourning, or celebration of significant events of the Spanish Crown. Such was the case when the colonial authorities in Manila undertook a series of measures to clean, groom, and adorn the streets to observe the public mourning of the death of Carlos III.[34] These measures however were very occasional and unusual. The colonial capital for most of the year remained sluggish and demonstrated an image of decadence. Aguilar opined that the state of the streets did not reflect an image of a civilized capital—the roads were unbearable because of the foul smell, the passages were obstructed by a multitude of embarrassing little shops that have become breeding ground and hideaway of countless idlers, vagrants, and thieves. He added that the city lacked organization. Zoning was inexistent as multitudes of housing made of poor and light materials (*covachas y casillas de caña y nipa*) prone to fires were mixed with the ¨noble and elegant buildings¨ of the city.

Using forced labor, Aguílar attempted to better the public aspect and physical appearance of the capital by focusing primarily on improving the state of streets and roads in the capital. Streets were constructed, paved, and reformed by building solid embankments on the center and putting more spacious and comfortable footpaths made of stone on both sides of the thoroughfare (*poner un sólido terraplén por su centro y de banquetas de losa cómodas y espaciosas por los costados*). The embankment of the streets was constructed by utilizing lime, sand, seashells, and cane honey. When mixed and left to dry for several days, the mixture solidified resulting to a cement-like state of petrification and solidification. Meanwhile, the footpaths which varied in width were constructed by utilizing cobblestones from China. Aguilar lauded that the use of this material was at par with that of European cities since the ¨oriental granite¨ was known for its good properties of not being slippery, of incalculable durability, and of beautiful appearance¨. The considerable number of Chinese cobblestones and the 3,000 pesos that the previous administration of Gov. Feliz Berenguer de Marquina left behind was used as initial capital for the street construction during the term of Aguílar. Later,

[34] AGI, Filipinas, 389, No. 16 Extracto de carta del Gobernador de Filipinas remitida al Consejo, Manila, 9 de julio de 1791.

the fines collected from all infractions of street laws and regulations were channelled to the public work project while utilizing the manpower of forced labour from apprehended recalcitrant, vagrants, beggars, and undocumented individuals.[35] Aguilar had these words to say with regard his projects on public streets:

> I vigorously undertook the project of paving the streets of the City [Intramuros] and of extramuros, the construction of sewage and drains, and the rehabilitation of a magnitude of bridges that facilitate the transit for public walks, having had the satisfaction of seeing the projects almost realized in the span of two years with hopes that these public works will be concluded in [18]97 to [18]98.[36]
>
> *Emprendí con vigor la del enlozado de la Ciudad y calles principales de los extramuros, construcción de sumideros y desagües, y rehabilitación de una magnitud de puentes que facilitan el tránsito para los paseos públicos, habiendo tenido la satisfacción de ver casi realizado el proyecto en el espacio de dos años con esperanzas de que las obras públicas se verán conclusas en el de 97 a 98.*

Aguilar reported that by 1797, his administration undertook the construction of 990,000 yards of street embankments and 200,000 yards of footpaths in and outside the walls of the capital.[37] To carry out the public works projects of his administration, Aguilar looked on ways on how to create a specific fund for the building of streets, roads, plazas and public spaces, the establishment of public lighting and the assignment of night watchmen for the colonial capital. Commenting that the colonial government could not depend solely on the funds collected from the resident´s contribution nor from fines imposed on law infractions, the highest colonial official advised the Spanish Crown that two tons of products from the galleon trade be allocated for these public works projects in the empire´s Pacific territory. Moreover, an additional tax for all textiles that is introduced in the colony was also proposed by Aguilar.[38]

However, instituting new policies for street zoning, construction, and repair was not easy according to Aguilar. Although he named Don Manuel Camus Herrera (Coronel de Milicias), Conde de Lizarraga, Regidor Don Manuel Conde, and Don Antonio Madrigal (Comisario de Obras Reales) as some examples of higher ranking officials in the capital who

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[35] Ibid.
[36] AGI, Estado 46, No. 35. Gobernador de Filipinas sobre reformas de calles de Manila, 25 de marzo de 1800.
[37] Ibid.
[38] AGI, Estado, 46, No.36 Carta de Rafael María Aguilar, Gobernador de Filipinas sobre alumbrado de Manila. Carta nº. 29 del gobernador de Filipinas, Rafael María de Aguilar al Príncipe de la Paz dando cuenta del establecimiento del alumbrado en la ciudad de Manila y proponiendo los medios para crear un fondo con que sostener este objeto, el de sereno y el de la composición de calles, puentes, y paseos, que hasta ahora se ha costeado con el fondo de la suscripción de muchos vecinos, de algunas multas y de donaciones particulares, Manila, 28 de febrero de 1797.

were supportive of his urban reforms, total compliance was not instinctive as he faced resistance even from one of the colonial administrators, the Corregidor of Tondo Don Santiago Salaverría. In his report, no specific reason was given why Salaverría opposed the road works projects except that ¨a sense of general apathy¨ was shown by the official.

This would be the continued practice for the next half a century but new construction materials, such as concrete, will be introduced and employed after the second half of the nineteenth century. Streets that lacked cobbling were paved utilizing lime and broken bricks mixed with concrete and sand such that with humidity and pressure a sort of mortar is produced.[39] However, public health reformers of the time pointed out that this mode of construction produce an immense mass of fine dust during dry season.[40]

Streets need constant repair, upkeep, and maintenance. In the 1820´s, just about twenty years after the first intensive street construction and repairs were done in Manila and its suburbs, accounts of the worsening condition of thoroughfares were already reported. It seemed, however, that the streets outside Intramuros were a bit in better condition than the ones inside the walls, perhaps due to the commercial vibrancy of the bustling arrabals in extramuros. An English traveller, commented that in Intramuros the paved streets made of granite from China were ¨narrow and dirty; and the middle being a hollow, in rainy weather forms a continued puddle¨. The foreign visitor also remarked that the pavements were in dire need of repair and most of the streets inside the walls were not optimized as half of them were generally occupied by large houses or convents and were filled with dirt and debris. Meanwhile, the streets leading to the suburbs were depicted as cleaner than the those in the walled city. While the roads needed watering due to the insufferable dust, the trees beside the streets made the journey much tolerable.[41]

While it was evident that reforms were introduced in street public works, the state of street construction and repair *still* reflected the constant inadequacy of budget in the colony. A few years before the end of Spanish rule in the archipelago, the city government of Manila once again endeavored to revitalize and stimulate urban reforms in the capital. In its budget proposal for the year 1892, municipal authorities of Manila hit back at the central colonial government when the latter only sanctioned a 26,000-peso budget for street construction and repair. This

[39] AHN, Ultramar, 5173, Exp.48, Autorizando el gasto de 4.000 pesos al Ayuntamiento de Manila para el riego de calles y paseos, 1859, Informe de la Junta de Sanidad, 17 de abril de 1860.
[40] Ibid.
[41] "An Englishman," "Remarks on the Philippine Islands and on their Capital Manila, 1819 to 1822." in Blair and Robertson (1903-1907), vol. 51, p. 168.

budget, even if re-enacted every year, was deficient according to the city administrators. In their view, ¨the amount given is impossible to maintain streets and walks in normal state¨ (*con la citada suma es imposible conservar en mediano estado las calles y paseos*). They added that it was clear that Manila´s budget was not proportional to the scope of the roads works projects in the colonial capital. Table 2 compared Manila and the Spanish empire´s metropole Madrid to the budget for road works of the French-occupied Saigon and Paris, the empire´s capital. We can infer from the table that by the late nineteenth century, Manila was almost four times bigger in extension than Saigon. Yet, the appropriated budget of the two cities for road and street construction and improvement were almost the same. This comparison was made by Manila´s municipal government to demonstrate how underfunded the capital was compared to one of its neighboring cities in the region.

Cities	**Area in square meters**	**Annual material expenses (in pesos)**	**Annual expenses per square meter (in pesos)**
Paris	8,517,000	2,200,000	0,25
Madrid	2,255,650	275,000	0,12
Saigon	420,000	23, 000	0,05
Manila	1,500,000	26,000	0.02

Table 2: Annual Budget of Paris, Madrid, Saigon, Manila for street construction and repair. Source: *Proyectos de presupuestos municipales de la ciudad de Manila para el año de 1892.*

The annual expenditure for the repair and maintenance of Manila´s roads cannot be more limited and reduced. The municipal government argued that a budget of no less than 60.000 pesos for public roads in this City should be allocated. With this, a budget of 0.04 per square meter of road could be apportioned which was still worse than Saigon´s allocation. For Spanish authorities in Manila, this was inacceptable given Manila´s longer history of being an entrepôt than the French Indochina territory.[42]

Paving the street was the first of a series of steps towards reforming this public space. A wider plan of reforming the streets included the naming of the streets and numbering the houses in Manila and the suburbs.

[42] *Comisión Permanente de Presupuestos del Ayuntamiento*. *Proyectos de presupuestos municipales de la ciudad de Manila para el año de 1892*, 1891, p. 10.

C. Street Naming and House Numbering

In colonial Manila, named and numbered streets became integral to the daily implementation of urban decrees and to their effective execution. Naming the streets made the city ¨more legible¨ and ¨more governable¨,[43] therefore more controllable according to the colonial framework. This mechanism made the residents ¨addressable¨.[44] Naming was one technique to which a well-organized system was put in place in the city where:

> the surveillance functions of the state, functions which ranged from the taking of a population census, police work such as inspecting houses, instituting arrests, posting notices, and serving summons and tax obligations on occupiers, to public health concerns such as tracing the source and spread of dangerous infectious diseases were enabled.[45]

The Ayuntamiento de Manila in its letter on 25 May 1780, with the approval of then Governor General Basco y Vargas, submitted a report with a corresponding plan on the proposed division of the capital into four *cuarteles* or barrios.[46] According to the proposal, the new arrangement of the capital involved the ¨division of barrios, the designation of street names and house numbers, and the registration and documentation of individuals and families¨ (*división de los barrios,* nombramiento de las calles, numeración de las casas y el *empadronamiento de los individuos y las familias*).[47] This measure, however, was not well-received in Madrid not strictly by what was stated in the proposal but how it was carried out in the colony. The Spanish Crown in a letter on 5 March 1784 expressed its displeasure to the governor general in the Philippines for not securing the royal approval before implementing

[43] Reuben Rose-Redwood, ¨Indexing the Great Ledger of the Community: Urban House Numbering, City Directories, and the Production of Spatial Legibility,¨ *Journal of Historical Geography,* 34 (2008), pp. 289-290; Rose-Redwood and Anton Tantner, ¨Introduction: Governmentality, House Numbering and the Spatial History of the Modern City.¨ *Urban History,* 39, 4 (November 2012), p. 607; Marco Cicchini, ¨A New ¨Inquisition¨?: Police Reform, Urban Transparency and House Numbering in Eighteenth-Century Geneva.¨ *Urban History,* 39, 4 (November 2012), p. 615; Richard Harris and Robert Lewis, ¨Numbers Didn´t Count: The Streets of Colonial Bombay and Calcutta¨, *Urban History,* 39, 4 (November 2012), p. 641.

[44] Anton Tantner, ¨Addressing the Houses: The Introduction of House Numbering in Europe,¨ *Histoire & Mesure* XXIV-2 (2009).

[45] Yeoh (2003), p. 220.

[46] Unfortunately, the extant documents in the *Archivo General de Indias* do not include the detailed corresponding plan nor the specific articles on the jurisdiction of these barrios. However, we do know from this document that during this period the municipal authorities were already laying out the first steps toward a new urban configuration of Manila.

[47] AGI, Filipinas, 337, L.20, f213r-215r. Carta del Rey al Gobernador de Philipinas manifestándole lo reparable que ha sido se haya puesto en ejecución lo dispuesto por el reglamento sobre división de barrios sin haber contado con la Audiencia y lo demás que se refiere, El Pardo, 5 de marzo de 1784.

urban policies and ¨warned not to omit this diligence in cases of the same nature in the future.[48] Despite this admonition from the metropolis, the measures were implemented in the colony as reflected in the 1787 and 1794 urban decrees.

However, colonial officials observed in the first half of nineteenth century that many streets were still left unnamed in the capital. On 14 August 1848, the Ayuntamiento de Manila through Jose de la Herrán, Jose de Aguirre, Francisco Reyes, and Rafael de Castro asked the central colonial government of Gov. Gen. Fernando de Norzagaray to create a commission that would oversee the inspection and correction of all street names, house numbers, and other street signposts in Intramuros and the suburbs. The Ayuntamiento opined that it was not enough to focus exclusively on improving the physical aspect of buildings, because these were not the only features that give an idea of progress and civilization. They cited that the streets´ names and the numbering of houses lacked order and uniformity. The characters were misspelled, inconsistent and irregular. It also reported that the capital and the suburbs were characterized by writings and signages of stores, meat shops, and industrial establishments that were ¨ridiculous and indecipherable¨.[49]

Consequently, the municipal government recommended two things: first, to require all street names, numbers of houses, and street signages be correctly-written with the shape and size proportionate to the place where they were placed, and second, that the urban police tasked to maintain the uniformity and cleanliness of the city be vigilant in the compliance of this decree. A commission headed by D. Lorenzo Moreno Conde then Director of *Escuela Pía* undertook the task of correcting the numerous misspelled names, words, and signages and arranging the disordered labeling of street names and house numbers not only in Intramuros but also in the more important suburbs of Binondo, Santa Cruz, and Quiapo. Two decades and a half later, the Ayuntamiento de Manila again reported the deplorable state of the city and its suburbs because it lacked the essential requirements of an educated population which involved the proper and efficient naming of streets and numbering of houses¨. The report highlighted that most of the streets of the colonial capital remained unknown and unnamed and owners of most houses put numbers and characters according to their whim.

[48] Ibid. ¨*Os lo prevengo a fin de que no omitáis esta diligencia en los casos de esta naturaleza que en lo sucesivo puedan ofrecerse, por ser así mi voluntad.*¨

[49] AHN, Ultramar, 5173, Exp. 28, Gasto para arreglo de los rótulos públicos de Manila, 1859, Informe del Ayuntamiento de Manila, 14 de agosto de 1858.

In 1875, the Ayuntamiento de Manila once again appropriated municipal funds for the wider implementation of street naming and house numbering. The first proposal was to put street and house labels made of marble for areas with houses built of stone and other strong construction materials. Meanwhile, labels made of painted *molave* wood will be placed in areas with houses made of light construction materials. The amount needed to carry out this project reached 9,045 pesos, and was considered too costly for the municipal government. A counterproposal was submitted by the municipal Architect recommending the use of glazed ceramic just like the ones used in the street labels of Sevilla and Cádiz. This became the approved proposal together with a 1,670 peso-budget for the labeling of streets and 1,250 pesos for the numbering of houses. This was reaffirmed by the central government in Madrid and reminded the officials in Manila that no amount should be exacted from house owners with regard the house labels due to the earthquakes suffered by the residents earlier of the same year.[50]

D. A New Layout for the City: Widening and Aligning the Streets

By the second half of the nineteenth century, ideas of a modernist city characterized by wider, aligned, and well-organized streets and spacious public spaces were envisioned in the public works policies in colonial Manila. The rapid urbanization experienced by the colonial city resulted to an increase in the number of settlements and, eventually, to their agglomeration. In fact, the nineteenth century witnessed the onset of what is labelled urban slums of today- a mass concentration of insalubrious, untidy, and disorganized urban settlements. Increased mobility of peoples and carriages in the streets necessitated more space for movement. For the health reformers at the time, these images posed serious concerns to the salubrity and order of the city. Furthermore, the ravaging fires and the disastrous earthquakes that shattered the rapidly urbanizing capital in the nineteenth century worsened the city´s urban configuration. Greg Bankoff argues that these disasters were ¨catalysts of change that shaped the urban environment¨.[51] For instance, the 1863 San Nicolás fire and the two successive conflagrations that hit the capital on 30 Abril and 2 May of 1865 marked a more urgent and clear policy on

[50] AHN, Ultramar, 5243, Exp. 46, Sobre autorización para exigir de los dueños de casas de Manila y sus arrabales reintegro del importe de los números que en las mismas se coloquen al hacer la numeración que proyecta el ayuntamiento de aquella capital, Informe del Ayuntamiento de Manila, 15 de septiembre de 1880.
[51] Bankoff (2012), p. 184.

the new layout (*nuevos trazados*) of streets and dwellings in the city. These catastrophes, amid the city´s accelerated growth, were compelling reasons behind the widening and aligning of streets (*ensanchamiento y alineación de las calles*). These street improvement projects forced the colonial officials to devote more attention to street design, regulation, and management.

For uniformity and standardization**,** the instructions on the new layout and alignment of streets of 19 December 1859 implemented in the peninsula were adopted in the Ultramar. In the Philippines, these instructions (*Instrucciones para la ejecución de los planos de alineaciones*) were reiterated in the decrees on 10 May 1865[52] and on 9 July 1867[53] as new plans for the (re)configurations of streets and districts were carried out. The instructions emphasized the important techno-scientific role of the *Inspección General de Obras Públicas (IGOP)* and the *Junta Consultativa de Obras Públicas*, underlining that the plans should be carried out by engineers and architects. (See Appendix Chapter 4, A) These ordered the clear, precise, detailed, and exact drawing of plans and blueprints with the corresponding names of streets and labels of existing and proposed edifications. Reports or *memorias* were required which provided the justification, budget, materials, and other specifics of the proposed project. These regulations were applied in the proposed layout for barrio San Nicolás authored by the military engineer Esteban Peñarrubia which served as a model for the reconfiguration of other suburbs after the several incidents of fire in Tondo, Santa Cruz, Quiapo, San Miguel and the street improvement project in Ermita authored by Cayetano Cristobal.

The case of barrio San Nicolás

Perhaps one of the most significant, illustrative, and arduous case of street aligning and widening was the planning and execution of a new plan for barrio San Nicolás in the first half of the 1860´s. San Nicolás, a barrio bounded by Tondo and Binondo, during the time was described as a congested and narrow barrio inhabited by *nipa* houses of varied shapes and sizes. San Nicolás could be an example of a nineteenth-century Manila urban slum. The barrio which was home to fishermen, canoemen, labouerers, and urban workers was marked with a few narrow or tortuous alleyways, without drains, sewers nor cesspits, in need of water supply for public and domestic service, and deprived of any of the essential conditions of any cultured

[52] ¨Disposiciones para la ejecución del nuevo trazado en los arrabales de 10 mayo 1865,¨ *Gaceta de Manila,* Año V, nº 441, 17 de mayo de 1865.
[53] ¨Instrucción para la ejecución de los planos de alineaciones,¨ *Gaceta de Manila,* Año VII, Nº 1356, 28 de noviembre de 1867.

population.[54] Even until the late nineteenth century, it was often described that ¨in the wet season, water rushes all over from one to three feet deep¨ and the barrio is transformed to ¨little tide-water creeks and ditches that emit a sickeningly foul smell¨.[55]

Like most urban slums, the poor hygienic conditions of the barrio and the agglomerated houses of the inhabitants aggravated the problems brought by the waves of epidemics and the periodic typhoons, earthquakes, and fires that hit the city. Xavier Huetz de Lemps´ study on the origin of San Nicolás´ agglomeration in the late eighteenth century to the mid-nineteenth century explains very well the reasons behind the challenging transformation of the urban fabric of the barrio. It was a product of a ¨spontaneous¨ settlement of people due to several factors: the formation of a polder near the bay due to environmental and geographic changes which gave rise to a swampy settlement; the increasing construction of houses of labourers working in the growing tobacco and wine factories and other industries in urbanizing Manila; and a result of the westward movement of residents who were dislocated after the prohibition of houses made of light materials in Binondo.[56]

In the early morning of 31 January 1863, it only took a four-hour fire to transform the barrio into ashes. According to Huetz de Lemps, the municipal authorities of Manila viewed the incident as an opportunity to reform the San Nicolás neighborhood, exterminate the fire-prone dwellings of the natives, and to reconfigure the site for commercial and port activities.[57] Even before the 1863 fire, the Spanish government had repetitively promulgated edicts and decrees pertaining to fires in the capital which involved the eviction of *nipa* huts within the vicinity of Intramuros and the prohibition of constructing houses made of combustible materials near masonry buildings.[58] As a response, the colonial government recognized the need to rebuild the barrio, but this time around, dividing the land in regular and well-proportioned blocks separated by streets of twelve to sixteen meters' width. But the misery of the residents

[54] AHN, Ultramar, 522, Exp. 8, Aprobación del proyecto de nuevo trazado de los arrabales de Manila, No. 10 Comisión ejecutiva del nuevo trazado y repoblación del barrio de San Nicolás. Memoria descriptiva, causas que lo motivaron, orden de los trabajos, estado de trabajos, plano de ejecución por los señores alcalde 1ª elección Don Marcelo Ramírez, Don Ignacio Celis y el capitán comisionado para el trazado Don Esteban Peñarrubia, 5 de diciembre de 1866.

[55] E. Hannaford, E. (Adjutant), *History and description of our Philippine wonderland, and photographic panorama of Hawaii, Cuba, Porto Rico, Samoa, Guam, and Wake island, with entertaining accounts of their peoples and modes of living, customs, industries, climate and present conditions* (Ohio, The Crowell and Kirkpatrick Co., 1899), p. 103.

[56] Huetz de Lemps (2001ª), pp. 281-282.

[57] Ibid., p. 279.

[58] Montero y Vidal, Tomo III (1895), p. 33, p. 149, p. 223, pp. 295-296. The administrations of Berenguer de Marquina (1788-1793), Oraa (1841-1843), Urbiztondo (1850-1853), Crespo (1854-1856), Solano (1860), and Lemery (1861-1862). After the 1863 incident, the successive administrations of Echagüe (1862-1865) and Lara (1865-1866) felt the urgent need to reform the layout of streets and barrios in the suburbs. However, fires proved to be a perennial problem even until the end of the Spanish rule and the successive periods.

were not yet over as successive earthquakes shook the capital culminating in the disastrous June 3 earthquake that toppled down the city. It was only in 1865 that the plans for the new layout of San Nicolás were resuscitated. In the planning stage, colonial officials reiterated ¨the need for a standardized layout subject to the conditions of public hygiene and urban police which were previously completely neglected in the San Nicolás neighborhood (*la necesidad de un trazado regular con sujeción a miras generales de higiene pública y policía urbana, antes completamente desatendidas en el barrio de San Nicolás¨*).[59]

The San Nicolás barrio was definitely the antithesis of how the Spanish colonizers imagined the ideal grid-like formation of towns and cities- a glaring contrast to the evenly distributed streets of Intramuros just across the Pasig river. As seen in the San Nicolás blueprint (see Figure 1) authored by the architect Esteban Peñarrubia, an almost barrio-wide street reform was imperative. The black lines (traced in pencil) which showed the existing streets and houses revealed the disarrayed, constricted, and uneven layout of the barrio. The blocks with black borders represented the houses made of light materials while the shaded blocks in carmine were masonry edifices. To improve the condition of San Nicolás, colonial officials through Peñarrubia´s plan reconfigured the barrio by laying out well-proportioned, wide, and aligned streets. These would replace the old, irregular, random, and very narrow streets that posed serious threats to the security and salubrity of the barrio.

This new layout was represented by the red straight lines (see Figure 1.1 for a clearer reconstruction of Figure 1) that corresponded to the improved streets and better-organized blocks of houses. Examining the plan, it seems that the city planners utilized the streets of San Nicolás and Sevilla as axis from where the new street layout could be drawn. These were the only streets in the barrio where the street could *still* be easily traced out. Streets somewhat disappeared in the remaining areas of San Nicolás due to the random construction of houses of the natives. As a consequence to the straightening and widening of the streets, numerous houses had to be torn down and demolished along Pan Street[60], Vives Street (now Solana Intramuros St.), Echagüe Street (now Del Pan St.), Principe Street (now Del Pan St.[61]), Barcelona Street, Madrid Street, Jaboneros Street, Lara Street, Lavezares Street and Peñarubia Street. Figure 1.2 shows the magnitude and extent of the affected inhabitants of San Nicolás. For the urban planners and sanitation reformers, the knocking down of these unhygienic, overcrowded, and

[59] AHN, Ultramar, 522, Exp. 8, Aprobación del proyecto de nuevo trazado de los arrabales de Manila, No. 9 Informe del Gobierno Superior Civil, 15 de septiembre de 1863.
[60] This narrow and short street disappeared in the present-day map, perhaps already part of a national service road (Radial Rd 10).
[61] The streets are presently adjoined, both named Del Pan Street.

disordered settlements meant good governance and a step to colonial modernity. On the other hand, this measure signified the loss of homes and properties to hundreds of lower-class urban families and displacement of many fishermen near the Manila Bay which was their source of livelihood.

Figure 1: A blueprint of the old and the proposed layout of barrio San Nicolás in Extramuros Manila, with Manila Bay to its right and the Pasig River to the south. The light black lines represent the old streets and existing houses, the red lines represent the new layout of the barrio. The blocks in carmine were the existing masonry edifices while the areas shaded in yellow corresponded to properties for expropriation. See Figures 1.1 and 1.2 for the clearer reconstructions of this map.

Source: AHN, Ultramar, MPD. 5464, Barrio de San Nicolás. Plano de situación de los solares expropiados para vías públicas en el Barrio de San Nicolás según el trazado ejecutado por consecuencia del superior decreto de 17 de noviembre de 1863 y de las compensaciones que se han dado en el terreno de las antiguas calles, conforme a las disposiciones del Superior Gobierno de 17 de mayo y 31 de octubre de 1865.

Figure 1.1 A reconstructed version of Figure 1 to enhance the proposed new layout of San Nicolás and the streets affected by the reform measures. The red lines are emphasized to demonstrate the colonial government´s idea of wider and aligned streets and organized blocks of settlements.

Source: Costelo, 2020. Figure elaborated by using the data from AHN, Ultramar, MPD. 5464.

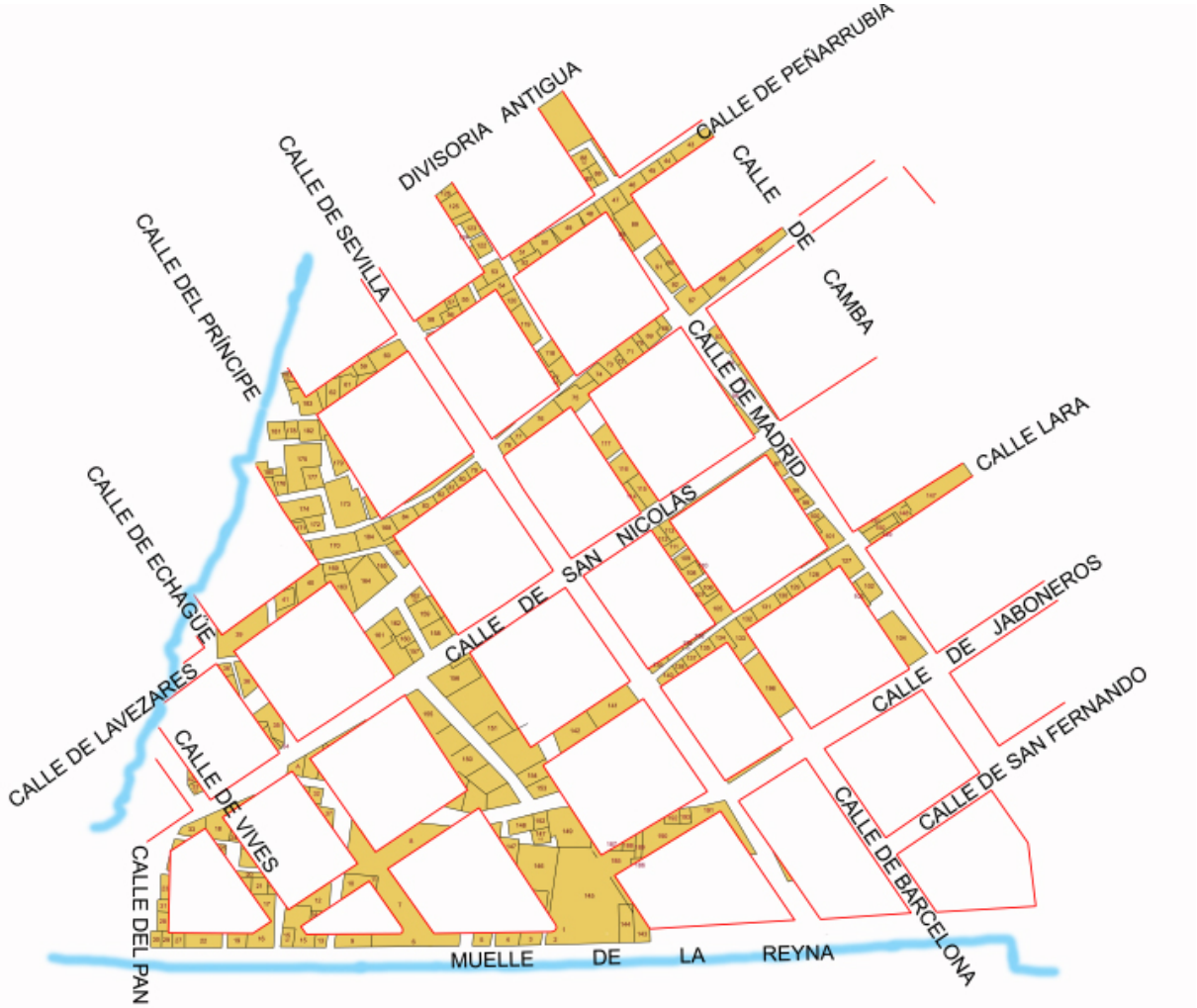

Figure 1.2 Another reconstructed version of Figure 1 which highlights the extent of affected houses and properties in the proposed San Nicolás layout. The blocks shaded in yellow correspond to the expropriated areas.

Source: Costelo, 2020. Figure elaborated by using the data from AHN, ULTRAMAR, MPD. 5464.

The cases of Carriedo Street (Quiapo) and Escolta Street (Binondo)

The narrow, irregular, and crooked streets of the capital generated serious problems of overcrowding and congestion especially in areas with increased economic activity and expanded movement of peoples and goods. The suburbs to the right of the Pasig River such as Binondo, Santa Cruz, and Quiapo witnessed these developments in the nineteenth century as business establishments and varied economic activities became concentrated in these areas during the time.[62] It was observed that Escolta alone had six thousand or more vehicles roll by

[62] Lagman and Martínez (2014), p. 68.; Chu (2010), p. 180.

every twenty-four hours.[63] The principal and important streets of these suburbs became sites of improvement to give way to the government´s paradigm of modern and hygienic thoroughfares. The road works projects in the streets of Escolta (See Figure 2) and Carriedo (See Figure 5) exemplified these colonial ideas.[64]

The municipal architect of Manila, Antonia Ulloa, and the colonial engineers of the IGOP were at the forefront in undertaking these street public works projects. An examination of the plans and blueprints produced by these techno-scientific men revealed an underlying philosophy that spread in European city construction and configuration in the late eighteenth to the nineteenth century. Influenced by Hausmann´s urban reformism paradigm of the past century, these architects and engineers attempted to translate the Parisian model of viewing Manila as a city composed of networks of arteries. Therefore, they argued that the improvement projects of Escolta Street and Carriedo Street were actually part of a bigger design of creating a *big artery* of wide and aligned roads for the busy suburbs of Binondo, Santa Cruz, Quiapo up to Sampaloc. The engineers remarked that:

> The Consultative Board of Public Works should not fail to recognize the indisputable convenience of the widening that is proposed since the street that would receive this improvement is not only the main road that unites the barrios but is also an integral and obligatory part of the ***great artery*** that starts on the right avenue of the Puente de España by the street of Escolta and ends in San Sebastian which then continues to the Real Street of Sampaloc.[65]
>
> *La Junta [Consultativa de Obras Públicas] no debe menos de reconocer la indiscutible conveniencia del ensanche que se propone, puesto que no solo la calle que recibiría esta mejora es la vía principal de unión entre barrios, sino que forma parte integrante y obligada de la gran arteria que empieza en la avenida derecha del Puente de España por la calle de Escolta y termina en San Sebastián para continuarse después por la calle Real de Sampaloc.*

In Binondo, the commercially vibrant street of Escolta had to be widened and aligned. The Escolta blueprint (See Figure 2 for the original blueprint) showed the proposed 20-meter and 14-meter street widening. The plan also consisted of extending San Jacinto Street (now Tomas Pinpin St.) up to the Pasig River to facilitate better the loading and unloading of goods from the river (See Figure 2.1 for a clearer construction of Plan 2). From Escolta Street, the arterial thoroughfare leads to the arrabal of Santa Cruz.

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[63] Hannaford (1899), pp. 74-75.
[64] AHN, Ultramar, 521, Exp. 18, Rectificación y ensanche de la calle de Carriedo de Manila, Calle de la Escolta y de San Jacinto y Ensanche del Paraje de Norzagaray Año de 1882, No. 3 Trazado de la calle de Carriedo de Manila que acompaña al proyecto de rectificación y ensanche de la calle de Carriedo, 1880.
[65] AHN, Ultramar, 521, Exp. 18, No. 3, Informe de la Junta Consultativa de Obras Públicas, 9 de febrero de 1881.

Figure 2: Escolta Street plan, 1881.

Source: AHN, Ultramar, MPD. 5430, Plano de la calle de la Escolta con las líneas que se propone, Manila, 21 de octubre de 1881.

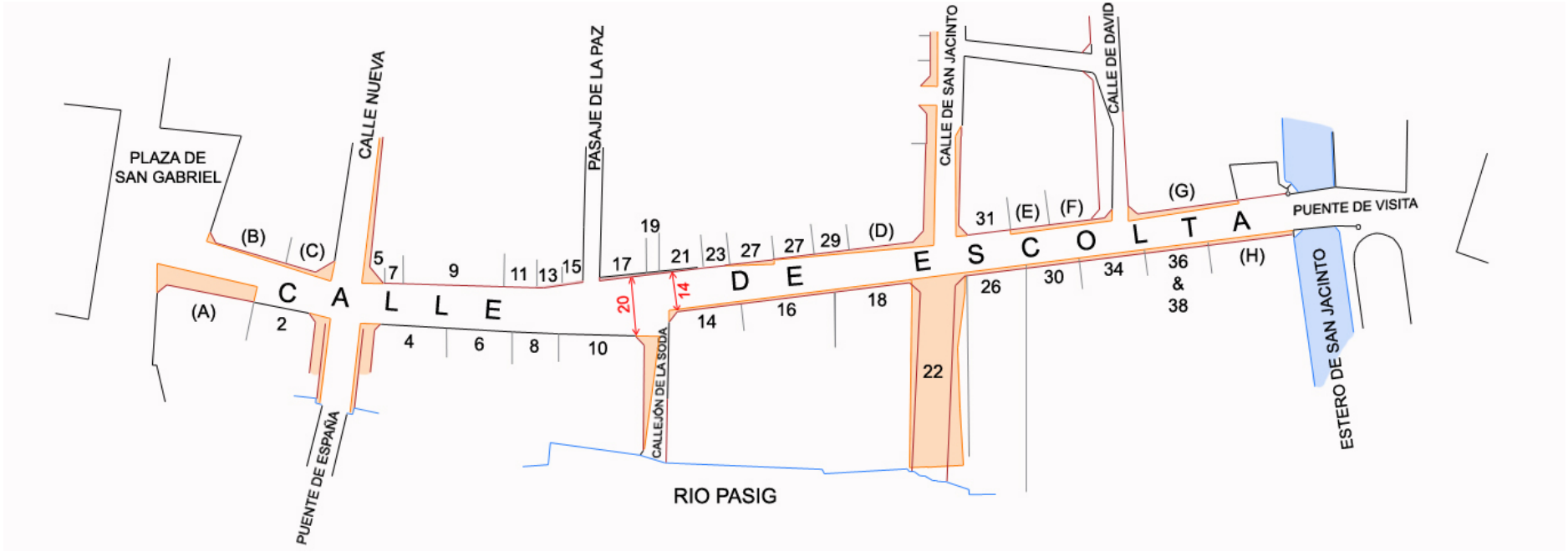

Figure 2.1 A reconstructed version of Figure 2 that demonstrates the street reforms in Escolta Street. Aside from street widening and aligning, the plan also involved the extension of San Jacinto Street (now Tomas Pinpin St.) as additional access to the Pasig river.

Source: Costelo, 2020. Figure elaborated by using the data from AHN, Ultramar, MPD. 5430

THE ESCOLTA AT ELEVEN O'CLOCK IN THE FORENOON

Figures 3 and 4: Opposing images of Escolta Street during two different times of the day taken in the late nineteenth century. Picture on the left (supposedly taken during 1:00pm after lunch and high noon time) shows a clear and orderly street. Pedestrians use the sidewalks on both sides of the street while parked carriages for rent are in line. Picture on the right (supposedly taken during 11:00 in the morning) shows disorder. The sidewalk could not be seen, perhaps covered by the shade of the stores on the left. Street vendors, pedestrians, and street carriages were all seen in the middle of the street.

Source: HANNAFORD, E. (Adjutant), *History and description of our Philippine wonderland, and photographic panorama of Hawaii, Cuba, Porto Rico, Samoa, Guam, and Wake island, with entertaining accounts of their peoples and modes of living, customs, industries, climate and present conditions,* Ohio, The Crowell and Kirkpatrick Co., 1899.

In Santa Cruz, Carriedo Street adjoined the suburb to the adjacent arrabal of Quiapo. Manila´s architect, Antonio Ulloa, designed a plan to reform the unaligned and constricted Carriedo street as seen in Figure 5 and Figure 5.1. Ulloa remarked that the narrowness of Carriedo Street, where some of its segments only reaching seven meters in width, was insufficient for the continuously growing street traffic in Santa Cruz and Quiapo and posed severe problems to public hygiene and salubrity. The plan revealed the constriction of the entire stretch of Carriedo from the Santa Cruz plaza, to the segments perpendicular to the streets of Dalumbayan and Salcedo (now Rizal Avenue), Quiotan (now Sales St.), to the most constricted areas between San Roque Street (now P. Gomez St.), Plateria Street, and Palma Street. (See Figure 5.1 for a clearer reconstruction of Figure 5) The plan ends in the iconic Quiapo Plaza and Church. As a solution, the projects undertaken by colonial architects and engineers, as seen in the blueprint of Carriedo Street, attempted to introduce the basic principles of order and symmetry in the laying out of new streets for the capital. For instance, Ullloa designed that a minimum standard of twelve-meter width should be imposed in the mentioned street. This twelve-meter width was devised to hold a two-meter space for sidewalks on each side of the road, another two meters for stationed carriages (*carruajes*) and the remaining meters for street circulation.[66]

[66] AHN, Ultramar, 521, Exp. 18, No. 1 Informe del Arquitecto de Manila Antonio de Ulloa, 8 de noviembre de 1881.

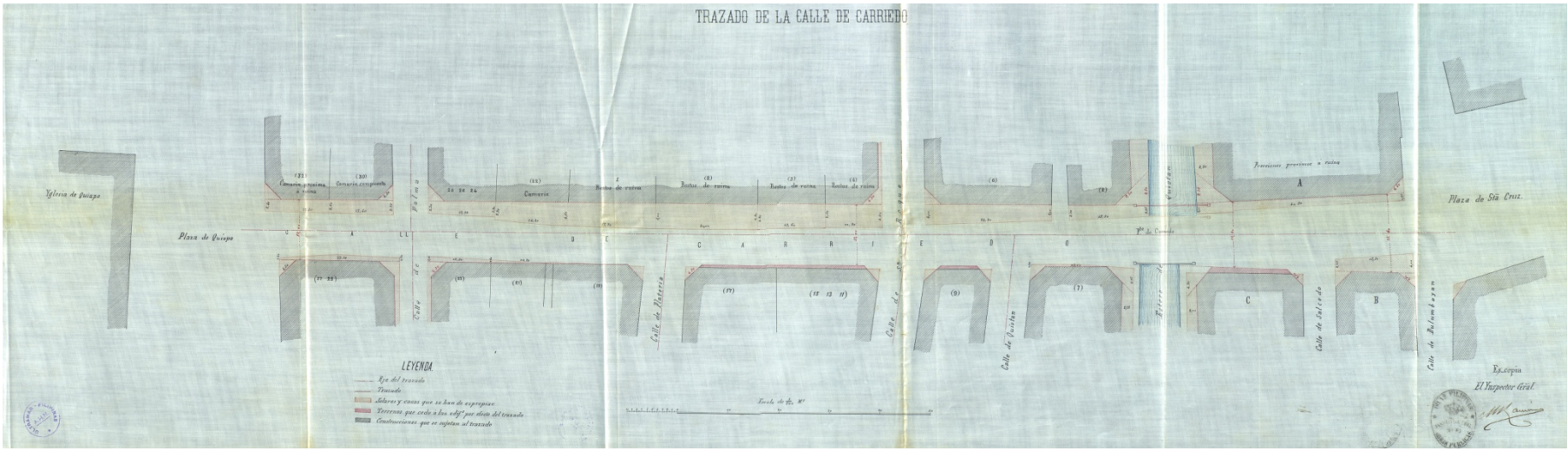

Figure 5: Carriedo Street plan, 1880.

Source: AHN, Ultramar, MPD. 5429, Trazado de la calle de Carriedo de Manila, 20 de diciembre de 1880.

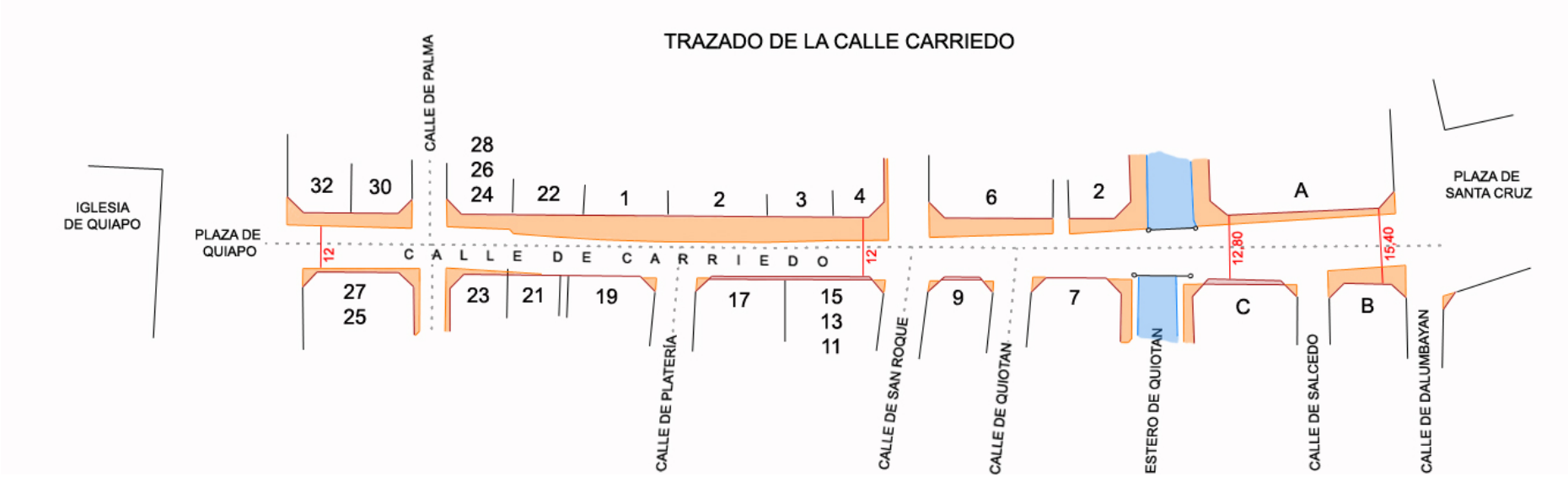

Figure 5.1 A reconstructed version of Figure 5 that demonstrates the street improvement projects in Carriedo Street.

Source: Costelo, 2020. Figure elaborated by using the data from AHN, ULTRAMAR, MPD. 5429

The urban planners also attempted to incorporate the clearing of estuaries (*esteros*) from houses and other constructions in the new layout of the city. The structures and houses near these bodies of water concerned the city administrators as they impeded the flow of water causing difficulties in fire response such as in the 1865 incident in Tondo. Furthermore, these aggravated the sanitation concerns of the city as filth and garbage were easily thrown at these tributaries. This was observed in the Carriedo plan as existing structures beside the Quiotan estuary *(estero)* were proposed to be removed. In the case of the Carriedo blueprint (refer to Figure 5.), the blocks shaded in color orange referred to properties owned by the Church and private individuals that had to be expropriated to give way to the public works projects of street reform.

Aside from widening and aligning the streets, one interesting modification that the Spanish urban reformists introduced in Manila´s morphology was the building of *chaflán* or bevelled edges at the junction or corner of the streets. In the mid-nineteenth-century, increased number of street-users became a typical sight for Manila. To improve street circulation, provide more convenience to carriages, and prevent accidents inflicted at pedestrians and passers-by, these truncated corners were integrated in the proposed street layouts to provide more space for coachmen to maneuver their carriages.[67] Later, Manila´s authorities led by then civil governor Manuel de Azcárraga, passed a resolution on 6 April 1869 that obliged all houses and edifices, both in the zones of light and heavy construction materials (*zona de materiales fuertes y materiales ligeros)* to build these angled street corners.[68] The Carriedo and Escolta street improvement plans integrated this reform as shown in the proposed plans. The figure below shows, for example, a magnified view of the intersections of Carriedo Street and San Roque Street (now P. Gomez St.), and the proposed bevelled corners at 4.50 meters. Urban reformers envision that the confluence of these four streets corners would also serve like a polygon-shaped plaza. In effect, the corners were designed not only to prevent street dangers and facilitate the movement of sidewalk users but also contribute in improving the physical ornate of public spaces.

[67] ¨Disposiciones para la ejecución del nuevo trazado en los arrabales de 10 mayo 1865¨. *Gaceta de Manila,* año V, nº 441, 17 de mayo de 1865.
[68] ¨Bando de 6 de abril de 1869,¨ *Gaceta de Manila,* 8 abril de 1869.

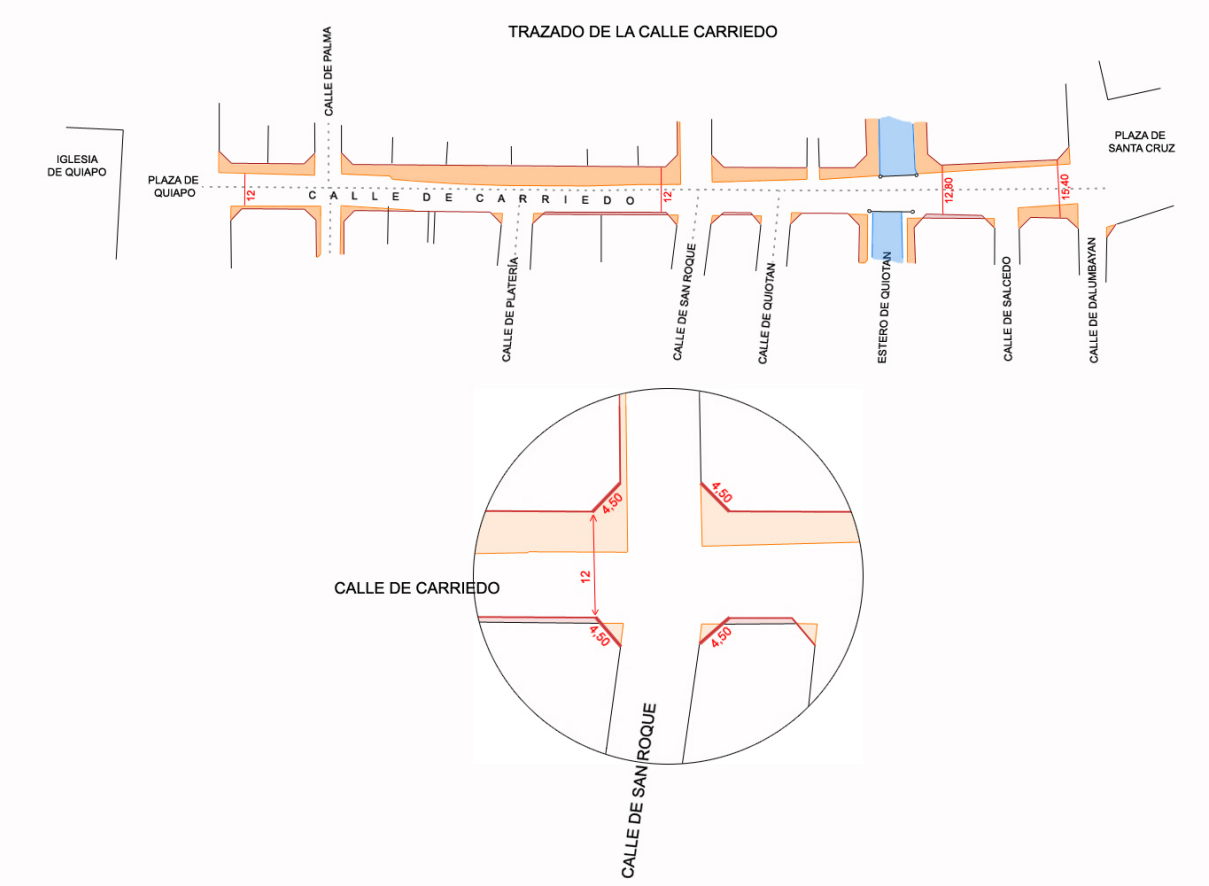

Figure 5.2 A reconstructed version of Figure 5 that highlights the construction of *chaflanes* or bevelled corners in the street junctions along Carriedo Street

Source: Costelo, 2020. Figure elaborated by using the data from AHN, ULTRAMAR, MPD. 5429

As wider streets and sidewalks were introduced in the new city layout, this also meant that more space, already occupied by residents, had to be taken over to form part of the ¨public space¨. As already pointed out by Xavier Huetz de Lemps´ important study on the construction practice and policies in nineteenth-century colonial Manila, unfortunately the easiest to be displaced in this undertaking were the poor residents of the city, just like the houses made of light construction materials such as *nipa* and *caña*.[69] For instance, the displacement of residents who were unable to present land titles and delayed compensation of expropriated lands and properties characterized the San Nicolás project.[70] The complaints of the displaced lower class residents were oftentimes silenced in the official pages all in the name of urbanization of modernity.

[69] Huetz de Lemps (1998a), p. 165-167.
[70] Huetz de Lemps (2001ª), p. 290.

A direct consequence on the need to increase the physical capacity of the circulatory system of the streets, sidewalks, and bridges was the expropriation of private lands and properties. This caused resistance and contention in colonial Manila such as the protest in Escolta Street. The planned street improvement in Escolta resulted to the filing of a complaint by some residents against the forced demolition of their homes and properties.[71] The properties to be expropriated from these individuals are the orange-shaded blocks in the Escolta blueprint as seen in Figure 5.3. The magnitude of land and property confiscation differed from one resident to the other. Some residents were compelled to give up a minimum of two meters (for example, Property No. 29), seven to eight meters (for example, Property D) of their houses and properties while some others had to relinquish almost the entire property (for example, Property No. 22).

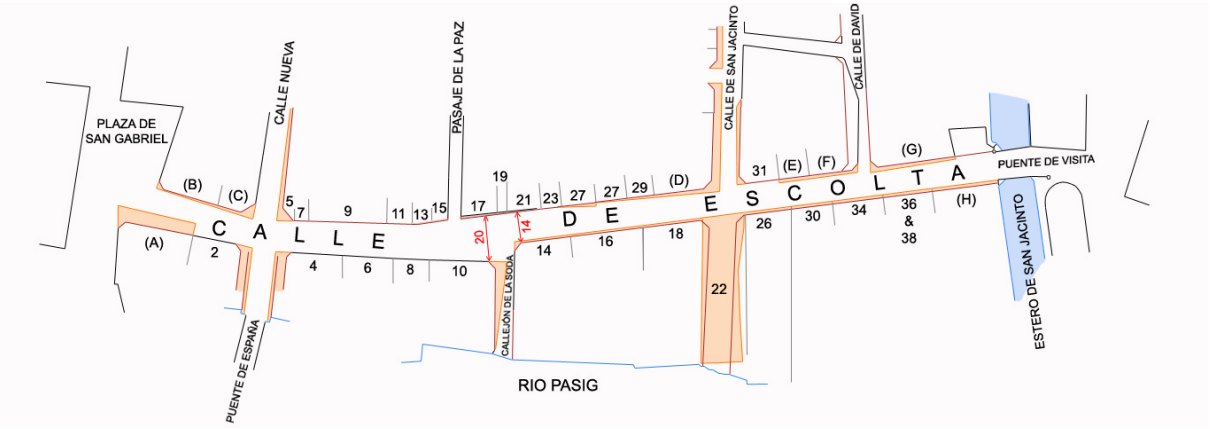

Figure 5.3 A reconstructed version of the Escolta plan showing the house and property numbers

Source: Costelo, 2020. Elaborated by using the data from AHN, ULTRAMAR, MPD. 5430

The table below shows the names of property owners and their corresponding house numbers. Almost all houses, except for a few, were numbered at the time.[72] The existence of house numbering in Escolta Street is a clear indication of its significance in the colonial life of the city. Houses were designated by the colonial government with odd and even numbers for easier profiling and documenting, as already discussed in the first part of this chapter. While

[71] AHN, Ultramar 521, Exp. 18, Carta del Gobernador General sobre la rectificación y ensanche de la Calle Escolta, 22 de marzo de 1882.

[72] For a clearer appreciation of the plan, letters (A, B, C, D, E, F, G) were already designated by this researcher to houses without numbering in the original plan.

the house numbers served as a code for the colonial government, this *code* was also utilized by the property owners for the purpose of establishing their domicile and right to property.

Even-numbered Houses and Properties in Escolta Street	**Odd-numbered Houses and Properties in Escolta Street**
(A) Don Gonzalo Tuason	(B) Don Máximo Paterno
No. 2 Don Antonio Casal	(C) Don José Ma. Tuason
No. 4 Don Pedro Roxas	No. 5 Administrador Sr. Genalo
No. 6 Don Manuel Somes	No. 7 Don Ygnacio Gorricho
No. 8 Administrador Don Ygnacio Gorricho	No. 9 Don José María Tuason
No. 10 Don Ygnacio Gorricho	No. 11 Doña Juliana Gorricho
No. 14 Don Antonio Enríquez	No. 13 Don Antonio Estrada
No. 16 Don José P Gardoncillo	No. 15 Don Joaquín Pardo
No. 18 Don Pedro Roxas	No. 17 Don Joaquín Pardo
No. 22 Don José Grey	No. 19 Don Mariano Fuentes
No. 26 Don José Anciburo	No. 21 Don Gabriel Esquibel
No. 30 Don Tomás Tuason	No. 23 Don Joaquín Pardo
No. 34 Administrador Don Adreano de Gorostiza	No. 27 Don Joaquín Pardo
No. 36 y 38 Administrador Don José de la Peña	No. 27 Don Gonzalo Tuason
(H) Don Juan Reyes	No. 29 Doña Eusebia viuda de Barredo
	(D) Don Juan Balbás y Ageo
	No. 31 Don Zoilo Ibáñez de Aldecoa
	(E) Don Modesto T Santos
	(F) Don Juan Bork
	(G) Don Felipe Govantes

Table 3: List of Property Owners along Escolta Street
Source: Data extracted from AHN, ULTRAMAR 521, Exp. 18

By simply looking at Figure 5.3 and the Table 3, we could see the names of property owners that were affected by the expropriation measures and the extent of property seizure to each proprietor. According to official documents, the proprietors in Escolta such as Don Pedro Roxas[73], José Grey[74], Don Luis de Anciburo, Don Gonzalo Tuason[75], Don Juan Balbás y

[73] The Roxas (Rojas) family is one of the leading mestizo families in nineteenth-century Philippines. Pedro Roxas (1848-1912) despite the lack of formal business education proved to be one of the most important businessmen of the time. See ELIZALDE in Elizalde and Yuste, 2018, pp. 222-228.
[74] The Grey-Ramos family owned houses and properties in Intramuros, Quiapo, and Binondo. José Grey´s brother, Nicolás Grey, was a known practicing lawyer in Manila at the time.
[75] The Tuasons are one of Manila´s most powerful and richest families in the Spanish Philippines. Gonzalo Tuason was part of the Luzon Sugar Company, Manila board of members along with Pedro Roxas. See LEGARDA, 1999, p. 330. He became a successor of the Tuason mayorazgo in the 1870s. See MCCOY, 2009, p. 562.

Ageo[76], and Don Zoilo Ibáñez de Aldecoa[77] expressed their disagreement with the expropriation of their properties. These names belong to the political and socio-economic elite of the time. Some were even past members of the city council such as Tuason, Balbás y Ageo, and Ibáñez de Aldecoa.

Unintended or not, expropriating properties and displacement was and would always be part of the public works projects in towns and cities. This process, however, only highlights the clear political and socio-economic disparities and inequalities in societies. In a colonial setting like nineteenth-century Manila, legal remedies to address the concern of displacement and right to property were mostly only accessible among middle class or elite residents. Meanwhile, the lower-class inhabitants were oftentimes pushed to relocate or to devise creative ways to evade government control. This disparity was evident if we would compare other aspects of the cases of barrio San Nicolás and Escolta Street.

In barrio San Nicolás, the new barrio-wide street lay out caused the dislocation of thousands of households while the Escolta project only affected thirty-five. In San Nicolás, identifying the names and providing identities to all the fishermen, labourers, and urban workers that were affected in the project was an enormous task. The colonial government reported that the planning was halted several times because of the difficulty in documenting the sprawled settlements. Houses, which took in almost 12,000 residents, were practically unnumbered. Moreover, the identities of the property owners and their proof of possession were heavily challenged. Lamentably, some individuals who claimed ownership to land and property in San Nicolás were not recognized by the colonial government because their titles did not meet the required legal conditions. The table below shows the names of the lowly residents, mostly native men and women, who lost their homes due to this colonial legal prerequisite and imposition.[78] Of the 61 indviduals who owned 64 properties, twelve were native or mestizo women, one was Chinese, and five had social status *(Don)*.

[76] Born to Tomás Balbas de Castro, a Spanish who migrated to the Philippines and gained fortune in mining and banking, and a mestiza mother. His brother, Tomás Balbeo y Ageo, served in the Inspección de Minas in the Philippines.

[77] A Spanish Basque who arrived in the Philippines in the mid-nineteenth century and established ¨Aldecoa y Compañía¨ which was engaged in exporting Manila hemp and other export products.

[78] ¨Comisión ejecutiva del trazado de San Nicolás. Relación de los dueños de terrenos cuyos títulos son defectuosos,¨ *Gaceta de Manila,* Año VI, nº 894, 21 agosto 1866.

Príncipe Street	Barcelona Street	Peñarrubia Street	Madrid Street	Jaboneros Street	Lara Street	Unidentified Streets
Antonio Bartolomé	Antonio Marcelo	Toribio Alejo	Don Bernardo Icazañas	Carmen Guevara	Mariano Lam	Mateo Mungi
Martín Ruiz	Felipa Roberto	Froilan Vitan	Don Juan Gavino		Santos de los Santos	Francisco Custodio
Nemesio Medina	Luis Oraá	Juana de los Santos	Don Toribio Míguez		Tito Macario	Don Roman Angulo
Bernardino Icazañas	Nazario Concepción	Regino Desiderio	Don Antonio Marcelo		Heriberto Salvador	Isabelo de Vera
Trinidad Morelló	Josefa Pineda	Pablo Marcelo	Pablo Marcelo Alvarillo (2 lots)			Mateo Buenaventura
Juan Zulueta	Ciriaco Vitan	José Antonio Martinez	Lucía Picache			Teodoro Salvador
Macaria Mungi	Basilia Torres	Valentín Ramos	Matea Rodríguez			Don Sergio Romero
Ángela Agraz	Catalino del Rosario	Lorenzo Ramos				
Tomás Rivera	Esteban Ramos	Guillermo Castañeda				
Sotero Rivadeo	Agustin Emeterio	Isabelo Francisco				
José Alejo	Nemesio Luciano	Pablo Marcelo Alvarillo (2 lots)				
Feliciano Reimundo	Mariano Saplan	Cayetano Reyes				
Ignacio Anastasio	Lucía Picache (2 lots)					
Andrés García						
Rafaela Salazar						
Ciriaca Campopus						
Lorenzo Ramos						
Chino Yap-Jua						

Table 4: List of proprietors whose titles were considered defective
Source: Gaceta de Manila, Año VI, nº 894, 21 de agosto de 1866

On the other hand, the Escolta plan was way more meticulous in documenting every meter of the property that an individual owned. All land area was measured; all areas and entities involved were labelled and documented.

The lowly and underprivileged residents of San Nicolás responded in several ways. Others chose to acquiesce and reluctantly followed the new layout, some relocated to areas where government control with regard construction and building requirements seemed imperceptible, others continued building homes using prohibited light materials as a form of resistance, others continued building homes using prohibited light materials as a form of resistance, while others moved to *accesorias* or *posesiones* or housing for people and families with low resources which were squatty, humid, and poorly-ventilated.[79] According to the military doctor Don Antonio Codorníu y Nieto who served as secretary of the *Junta de Sanidad* in the Philippines, these dwellings imposed by the colonial government which were supposed to be better and safer than the *nipa* houses became foci of diseases and disorder because they were cramped, poorly-ventilated, and unhygienic.[80]

On the other hand, the privileged and educated residents of Escolta built up their case and elevated the matter to the higher levels of colonial government. On the other hand, the privileged and educated residents of Escolta built up their case and elevated the matter to the higher levels of colonial government. Invoking that the expropriation of their possessions was a violence of their right to property, brothers Jose Grey, Nicolás Grey, and Manuel Grey y Ramos and José Fabie, argued that the planned street widening as well as the construction of San Jacinto passageway that would connect the Pasig river to the principal street of Escolta was unnecessary. According to these residents, poor street circulation was brought about not by the narrowness of streets nor the absence of alternative passageways but ¨by the terrible line of stationed wagons on both sides of the street specially near commercial establishments just like the *Café de la Campana¨* (*la fila fatal de carruajes estacionados a los dos lados de las calles especialmente en los establecimientos comerciales como muy particular el Café de la Campana*).[81] Almost half a year later, the central government castigated these residents for not supporting a project that was for the ¨greater good of public utility¨ (*a la verdadera utilidad pública*) and insisted that their objection, in reality, stemmed from their dissatisfaction on the acquisition price of the expropriated property which was at 45 pesos per square meter.[82]

[79] A more detailed discussion of this type of urban settlement was given in Chapter 3.
[80] Codorniu y Nieto (1857), p. 113.
[81] AHN, Ultramar 521, Exp. 18, Carta de los vecinos Jose Grey, Manuel Grey y Ramos, Nicolás Grey, Jose Fabie, 7 de diciembre de 1881.
[82] AHN, Ultramar, 521, Exp. 18, Carta del Corregidor de Manila, 7 de julio de 1882.

It is undeniable, at least according to archival sources, that the colonial government pushed for the construction and reconstruction of ¨regular and hygienic street layout¨ (*trazados regulares e higiénicos*). The plans for the barrio of San Nicolás and both streets of Carriedo and Escolta reflected a homologation plan showing the actual and proposed lines of street widening and aligning. To achieve regular and healthy streets, the narrow and irregular old set-up had to be aligned and broadened. However, this new layout meant the displacement of natives from their lands and houses. To avoid direct confrontation, they chose to relocate to areas where colonial control was more flexible or they were forced to build houses using materials that were beyond their economic means. Furthermore, the elaboration of a comprehensive, consistent, and city-wide plan for street constructions and improvement-which is key to successful urban planning- could not be said in the case of nineteenth-century Manila. While it is true that street reforms that improved the layout of some arrabales were undertaken, an encompassing and long-term plan of building a street network in the capital was lacking.

E. Cleaning the Streets

Reforming public streets did not end in its construction and reconstruction. Once constructed and paved, streets had to be maintained and kept clean and in order. The constant transit of men, carriages, and, animals commonly lead to street deterioration. Furthermore, as a heavily challenged space the streets become an area of vandalism, disorder, and delinquency.

Urban policies from the late eighteenth century to the first half of the nineteenth century repeatedly insisted on the property owners´ and residents' responsibility to observe urban and street sanitation and maintaining street cleanliness and hygiene. The municipal government´s despair on the noncompliance of residents in Intramuros and the suburbs to these decrees was repeatedly echoed in municipal decrees and reports. For example, it criticized that many houses in the walled city are unoccupied thus streets were left untidy and shabby. In fact, many poor families, including those living in Intramuros, practically had no resources for this service. With a tone of desperation, the municipal government confessed that street cleanliness continued to be a perennial problem despite numerous sanitation decrees. Eventually the municipal government was left with no choice but to ask for the central government´s permission if it could appropriate municipal money to fund the daily cleaning of streets not only inside the walls but as well as the *paseos* and the principal streets in the suburbs. They emphasized that

during the dry season, streets should be cleaned and irrigated twice; once in the morning and once in the afternoon. In the case of Intramuros alone, twenty-five carabao-pulled cleaning trolleys (*carros de limpieza*) filled with buckets of water were needed to irrigate the walled city. With this, the Ayuntamiento through the approval of the superior government granted a 4,000-peso annual contract to Don Joaquin Morelló to provide this urban street service. However, this contract was not seen favorably by the authorities in Madrid.[83] A royal decree on 2 December 1859 disapproved this planned urban service and reminded that no municipal funds should be used for this because it is the duty of all residents to clean and groom the street in front of their residences. Convinced of the urgency and importance of this service specially to the city´s public health, the Ayuntamiento appealed to the central government in Madrid and invoked the ideas of hygiene and sanitation to overturn the metropolis´ decision. Vicente Arrieta, Manuel Ramirez, and Joaquín de Loyzaga, members of the city council who also served as delegates of the Junta de Sanidad in Manila argued that:

> *The excessive transit, especially of carriages, wagons, and horses, the scarcity of rains in most of the months of the year, and the rapid drying out of soil even in the rainy season due to the intense sunlight in the tropics cause immense masses of fine dust with irritating qualities when street irrigation is neglected, which, produces chronic eye inflammation, causes perspiration and skin itching, irritations, and all kinds of outbreaks, and, although it does not result to deep inflammations in the respiratory apparatus, the fineness of the dust brings inconvenience to the houses in the city even with the lightest wind*.[84]
>
> *El excesivo tránsito, sobre todo de carruajes, carretones, y caballos, la escasez de la lluvias en la mayor parte de los meses del año y la prontitud con que aún en la estación de las aguas reseca el suelo por la acción del sol tan brillante de los trópicos, hace que en todas las ocasiones en que descuida el riego se levanten masas inmensas de polvo fino dotado de cualidades irritantes, que además de producir oftalmías de carácter crónico, hace que se adhiera a la traspiración y dé origen a pruritos, a irritaciones de la piel tan propensa a toda clase de erupciones, y aunque no ocasione el desarrollo de inflamaciones profundas en el aparato respiratorio, la finura del polvo es tal que, al más ligero viento se levantaba en verdaderas nubes que salvando las murallas de la plaza, hacían muy molesta la habitación de todas las casas de la circunferencia de la ciudad*.

Preoccupied by the health risk that these irritants may cause, the local authorities in Manila were able to convince Madrid that such measure was certainly a necessary public utility

[83] AHN, Ultramar, 5173, Exp. 48, Autorizando el gasto de 400 pesos al Ayuntamiento de Manila para el riego de las calles y paseos, No.1 Informe del Ayuntamiento de Manila, 13 de abril de 1859.
[84] AHN, Ultramar, 5173, Exp. 48, Autorizando el gasto de 400 pesos al Ayuntamiento de Manila para el riego de las calles y paseos, No.2 Carta de la Junta de Sanidad, Manila, 17 de abril de 1860.

and that the municipal government should start a sanitary policy that took into consideration the well-being of the entire neighborhood. This signaled the recognition that street cleaning should be part of the municipal urban service. However, it was only a momentary victory for the sanitary reformers in Manila because this urban service was not fulfilled throughout the end of Spanish rule in the Philippines.

Aside from washing the streets and collecting garbage, street cleanliness also entailed the regular supervision of drains emanating from the houses. For example, the *Guardia Civil Veterana* narrated the deplorable state of cleanliness and hygiene of Nueva Street in Binondo, a place where Chinese overcrowding was commonly reported. This sanitation problem was aggravated by the fact that many homes practice a repulsive and filthy manner of draining their household wastes directly to public roads. The plan shows that almost half of the ideal width of the street were occupied by private properties. On 31 March 1875, after conducting an inspection on the abovementioned site, the urban police found out that that two households along Nueva Street (now Quintin Paredes St.) of Binondo were practicing this type of drainage systems. The responsible individuals were identified as Francisco Mortera and Doña Cristina de los Reyes, owners of houses in No. 1 Nueva Street and No. 7 Nueva Street respectively. [85] Two months later, Antonio Ulloa, the municipal architect of Manila, reported that many houses do not have drainage systems and if they do, just like the aforementioned cases, it was very typical that they were ill-constructed and not fully covered, thus emitting a very foul odor that molested the entire neighborhood. [86]

Moreover, nineteenth century urban living in Manila was characterized with limited domestic space. Therefore, neat distinction and precise demarcations between the private home and the public street was hardly observed among natives. Oftentimes, domestic activities that could not be performed inside the houses were carried out in the front yards, streets and sidewalks which the natives consider as an extension of their household space. Two of the most common practices of natives that colonial authorities detested was their habit of cooking and taking a bath on the streets. This reality clashed with the colonizer´s idea of proper conduct and behavior in streets. The houses' lack not only of proper drainage but of private spaces for bathing was a recurring preoccupation of colonial authorities. The dirty water generated from public bathing result to numerous potholes and swamps in many streets all around the capital.

[85] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7452, Informe de la Guardia Civil Veterana, 31 de marzo de 1875.
[86] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7452, Informe de Antonio Ulloa, Dirección de las Obras Públicas del Ayuntamiento de Manila, 22 de mayo 1875.

Achieving clean and uncontaminated public streets remained a perennial challenge up to the last decades of the nineteenth century. In 1885, the municipal government in Manila once again reiterated the need to clean and clear the public streets. As a consequence, it proclaimed several *bandos* to re-enforce street cleanliness and order in the capital. These regulations intensified the existing norms with the cleaning and ornamentation of streets and houses, street traffic of people and carriages, and control of stray animals especially dogs. The *bando* obliged all residents of the arrabals to maintain the cleanliness of the front yard of their houses. Streets should be swept and washed twice a day: once every 7:00 o'clock in the morning and once every 5:00 o'clock in the evening. According to the municipal regulation, this rule should be observed by property owners and renters alike. However, potable water from the recently-installed fountains in the capital should not be used in street cleaning. The *bocas de riego* or fire hydrants were to be used in the cleaning of thoroughfares. First offenders were fined with 5 pesos while repeat offenders were fined with 10 pesos. In the eyes of the municipal sanitary reformers, hygiene was not only limited to the cleaning of streets and public spaces. They added that proper ornamentation of the façade of houses was crucial to creating a hygienic modern capital. As consequence, all residents were required to paint the façade, balcony, and walls of houses including the fences and vacant lots adjacent or near to their properties. As expected, the municipal government imposed fines ranging from 2 to 50 pesos for violators.[87]

In fact, the municipal government had to isolate dirty streets and enclose vacant lots that became sanitary threats to the capital. This was the case when the nearby residents of the old Alcaicería de Fernando[88] complained of the disgusting and sickening state of the unused property. On 24 February 1883, Don H. Julian and Don Gregorio Llorca, both residents of No. 12 and No. 14 San Fernando Street in Binondo, filed a grievance stating that ¨the residents of nearby streets and practically the entire barrio of San Nicolás used this site to relieve themselves and throw all kinds of rubbish, filth, and excrement without exception during the day and night. To this end, it emits fetid and corrupted smells at all hours that could possibly develop diseases that unfortunately we regret.¨[89] In colonial settings, open defecation was one of the most

[87] ¨Reglamento del Corregimiento de Manila de 7 y 9 de enero de 1882 por Manuel Enríquez,¨ *Gaceta de Manila*, enero de 1882.
[88] The Alcaicería de San Fernando was a separate building, constructed between 1752 to 1758, in Binondo that served as a royal market for Chinese goods and other products.
[89] AHN, Ultramar 521, Exp. 14, Presupuesto para el cerrado de una parte de solar de la antigua Alcaicería de San Fernando, No.3 Carta de los vecinos Don H. Julian and Don Gregorio Llorca, 24 de febrero de 1883.

outrageous practices cited by the colonizers against the colonized as it is ¨perceived to be at complete odds with the modern city¨.[90]

This complaint was affirmed by the Compañía del Puerto de Manila when it reported that the men assigned in the barracks of the customs guard suffered the same fate of being exposed every day to the unbearable smell experienced by the residents of San Fernando Street. They reported that boatmen (*banqueros*), who were mostly homeless, frequented the place to discharge themselves. According to the report, residents throwing garbage and filth accumulated in their houses as well as boatmen and nearby dwellers dumping collected night soil were common sights in the area during the day and night. Officials were also alarmed that it has become a common practice for animal owners to let their carabaos or water buffalo, goats, pigs, and other animals roam the area. Recognizing this as a sanitary threat, the municipal government together with the Junta de Sanidad´s intervention ordered the cleaning of the site and the close vigilance of the people´s activities in the area. Furthermore, the IGOP through engineer Don José García de Moron undertook a project of enclosing and fencing vacant lots, including the former *alcaicería,* to address this health peril.[91]

F. Clearing the Streets

For the colonial officials, street sanitation, order, and ornate did not only pertain to the cleaning and clearing of garbage and waste in its most literal sense. This also meant clearing the streets from all elements that may cause obstructions such ambulant vendors, vagrant individuals, and stray animals. However, ¨cleared streets and thoroughfares¨ was a highly-contested proposition in a bustling city like Manila. At first, streets were designed and constructed to be spaces for the exclusive use of pedestrians. Through time, the street gradually transformed that gave birth to its specialization. Alzate argues that this specialization of the street signalled the partition of a space composed of four fundamental elements: the street, the sidewalk, the fences or borders, and a central channel that serve as conduit or drain for sewage and other dirty water.[92] However, this increased ¨specialization¨ of the street resulted to the

[90] Renu Desai, Colin McFarlane and Stephen Graham, The Politics of Open Defecation: Informality, Body, and Infrastructure in Mumbai,¨ *Antipode,* 47, 1, (2015), p. 101.
[91] AHN, Ultramar, 521, Exp. 14, Presupuesto para el cerrado de una parte de solar de la antigua Alcaicería de San Fernando, No.1 Aprobación del gasto presupuesto redactado por ingeniero jefe del Distrito de Manila, 25 de agosto de 1883.
[92] Alzate Echeverri (2006), p. 76.

ambiguousness of this public space. In the case of colonial Manila, the numerous infraction cases to the ¨proper use and behaviour¨ of the ¨specialized spaces of the street¨ reveal the ambiguity and unclear lines between these elements. In order to make the society free from recalcitrant elements, the late eighteenth century to the nineteenth century was characterized by the colonial government´s numerous efforts to prevent vagrants from littering the streets. In addition, human activities related to street circulation and transportation were also regulated. Furthermore, roving animals, considered to be sanitary threats and typical disrupters of order in public streets were also controlled.

The early *bandos de buen gobierno* in 1794 and 1826 already prohibited vagrancy most especially on the streets of the capital. Vagrants were generally documented as *vagabundos, mendigos, vagos, rateros, sospechosos, sánganos and malentretenidos* in official documents. The promulgation of an Anti-Vagrancy Law in 1838 that specifically dealt with the ¨devouring cancer of vagrancy and gambling¨ (*el cáncer devorador de la vagancia y juegos prohibidos*) proved the growing concern of colonial officials towards this deviancy.[93] The law considered vagrants all those ¨who do not have an occupation; who, despite their robustness and young age, depend on mendicancy; recalcitrant sons who engage in vices, leisure, and corrupt behavior that scandalize the neighborhood; labourers who abandon their jobs to entertain themselves in clandestine cockfighting, prohibitive games, and drinking; men and women beyond 10:00 o´clock in the evening; individuals littering the streets and public spaces while intoxicated and drunk; persons who wander around streets, squares, and thoroughfares during the night; and residents without proper documentation¨.[94] Branded as individuals with ¨cycles of indiscipline and degeneracy¨,[95] the laws characterized vagrants as obstacles to the complete governability of the colony because, in the words of the colonial government, vagrants were the ¨seeds of disruption and disorder¨ (*semillas de perturbación y desorden*).[96]

[93] AHN, Ultramar, 5180, Exp. 11, Sobre medidas adoptadas para la persecución de los juegos prohibidos, No.4 Decreto de Andrés García Camba, 7 de marzo de 1838.
[94] AHN, Ultramar, 5180, Exp. 11, Sobre medidas adoptadas para la persecución de los juegos prohibidos, No. 5 Instrucción sobre el reglamento y modo de proceder las justicias ordinarias en las causas de vagos de 6 de setiembre de 1838.
[95] M.J.D. Roberts, ¨Public and Private in Early Nineteenth-Century London: The Vagrant Act of 1822 and its Enforcement,¨ *Social History,* vol. 13, no. 3 (1988), p.281. In fact, in the Philippines several decrees were promulgated to combat this cycle as proven by the decrees of 7 March 1838, 11 October 1847, 26 September 1859, 4 April 1863, 16 February 1868, 27 June 1872, and 26 August 1886.
[96] AHN, Ultramar, 5230, Exp. 40, Decreto del Gobernador General sobre deportación a los vagos y sospechosos y algunas mujeres prostitutas a la Paragua y Joló, No. 1 Carta del Gobernador General de 18 de septiembre de 1877

The penalty for vagrancy varied from the simple imposition of fines, to forced labour in road construction, repair, and other public works, to deportation. In 1853, the increased efforts of clearing the streets from vagrants and idlers as mandated by the 11 Oct 1847 decree resulted to the sentencing of 455 men and 65 women to the public works projects of the government while at the same time collecting 2,629 pesos as fines. Table 4 shows the colonial government´s report on number of vagrancy violators and the penalty that was collected from these infactors in the succeeding years.[97]

Year	Men Infractors	Women Infractors	Total amount of fines collected (in pesos)
1854	593	50	5, 181
1855	763	36	1, 250
1856	732	65	2, 550
1857	768	44	18, 403
1858	356	29	10, 737
1859	239	14	5, 475

Table 5: Number of men and women infactors of the Anti-Vagrancy Law and the corresponding fine collected per year
Source: AHN, Ultramar, 5180, Exp. 11[98]

Reflecting the alarming concern and the magnitude of the vagrancy problem in Manila, increased urban police was implemented and deportation was utilized as a typical punishment for vagrancy in the second half of the nineteenth century. Citing that they offended the anti-vagrancy acts, of 16 February 1868 and of 27 June 1872, Andres Montemayor, Lim- Pingco, Go Tiang-co, Domingo Banag and 112 other men as well as 35 women including Antonia Cataja, Serapia Cuevas, and an unidentified ¨Moslem woman¨ (*mora infiel*) , all identified as vagrants, thieves, and suspicious individuals (*vagos, rateros y sospechosos)* and mostly residents of Binondo, Ermita, Intramuros, Quiapo, Sta Cruz, Tondo and San Miguel were deported on 15 September 1877 to the agricultural colonies of Paragua and Joló in the hopes that the constant, assiduous, and hard work could moralize their vices and bad habits of vagrancy and theft¨ (See Appendix Chapter 4, B for the list of names of individuals considered

[97] This government report however lacked the details on how the fines were collected. It can be observed that the number of infractors did not necessarily translate to higher fine collection.
[98] AHN, Ultramar, 5180, Exp. 11, Sobre medidas adoptadas para la persecución de los juegos prohibidos, No. 18 Consulta sobre la reforma de la legislación vigente sobre juegos prohibidos, 26 septiembre 1859.

vagrants and were deported). A month later, another 150 men and 7 women with ¨bad habits and detestable behaviour¨ were deported to Joló.[99]

Chinese vagrants and social outcasts -who failed to present identification and proof of paying taxes and who were caught gambling, wandering, and drinking in streets and public places- became the subject of social control policies of the Spanish colonial administration in the nineteenth century. In his study, Galang documented 991 cases of arrested Chinese for violations of vagrancy, larceny (*ratería*), and for failing to present proof of identification (*indocumentados*) in the years 1837 to 1882. [100] The colonial government and the sanitary and medical professionals in Manila were also alarmed by the unhygienic service and disastrous industry that the Chinese offered in streets and sidewalks. For instance, many Chinese earned a living as ear cleaners in these public areas. The medical doctors of the *Facultad de Medicina* reported to have had identified fourteen to fifteen concentrations of this Chinese industry aside from more than 300 ambulant ear cleaners. They, however, did not specify the names of these locations. They only pointed out that the stools or *banquitos* of the Chinese ear cleaners were most visible in markets, public spaces, and the stairs of bridges in the suburbs of Manila.[101] This practice was considered pernicious and repugnant by the officials as the instruments used were unhygienic and unsafe and typically which became a source of contagion of varied diseases.[102] The medical doctors appealed for the central government´s intervention in prohibiting this practice which they considered as a mockery to a modern civilization and culture. To exercise control and regulation, many of these Chinese ear cleaners were fined not only for obstructing the streets but also for this public health threat.[103]

In the late eighteenth century to the nineteenth century Manila, a particular space in the street was designated for the pedestrian- the sidewalk or *acera*, which also contributed to the progressive normatization of the public space of the street. However, the sidewalk was transformed to be one of the most contentious space in colonial Manila. The public spaces of Manila became the circulating ground of the bustling informal economies based on the street such as itinerant vending and transport services of carriages and carriers (*cargadores*). These

[99] AHN, Ultramar, 5230, Exp. 40, Decreto del Gobernador General sobre deportación a los vagos y sospechosos y algunas mujeres prostitutas a la Paragua y Joló, No. 1 Carta del Gobernador General de 18 de septiembre de 1877.
[100] Galang (2019), p. 322.
[101] ¨Higiene Pública. Funesta Industria,¨ *Crónica de Ciencias Médicas de Filipinas* (Diciembre 1895), pp. 161-164.
[102] Ibid. p. 63.
[103] Ibid., p. 164.

two sectors became the principal targets of the urban policies of the municipal government in order to achieve clear streets in Manila.

Ambulant vendors and hawkers were identified as typical rule ¨offenders¨ because the colonial government notoriously branded them as one of the principal impediments to street order and circulation. The urban police´s monthly report almost always included undocumented vendors or obtrusive peddlers as street violators. For instance, an *india* named Macaria Buenviaje and a Chino identified as Tan-gueco were obliged to pay a one-peso fine on 17 April 1875 for selling their goods in the streets of Binondo. The *Guardia Civil Veterana* reported that the two individuals caused obstruction to the easy circulation of peoples and street carriages in the busy streets of the suburb.[104]

These violations however did not only serve as a control mechanism of the colonial force. Fines imposed on these infractions did not only serve as a deterrent but also a means of collecting additional funds for the municipal treasury. A number of street infractions were recorded by *Guardia Civil Veterana,* the capital´s urban police, after the promulgation of these regulations. For instance, on 1 October 1887, the 6th Subdivision of the *Guardia Civil Veterana* submitted the following list of names with different street violations.

Name of Offender	Domicile	Infraction Committed	Fine
Anastacio Panaligan	Malate	Guarantor of a stray horse	One peso
Don Reducindo Peña	Ermita	Guarantor of a stray horse	One peso
Pedro Fernández	Malate	Guarantor of a stray horse	One peso
Don Manuel de Villaba	Ermita	Guarantor of a stray horse	One peso
Doña María Sebornal	Ermita	Guarantor of a stray horse	One peso
Justo García	Malate	Guarantor of a stray carabao	One peso
Andrés Francisco	Ermita	Guarantor of a stray carabao that destroyed the garden of the Cavalry	Four pesos
Pedro Fernández	Malate	Guarantor of a stray carabao that destroyed the garden of the Artillery	Four pesos
Don Demetrio Caro	Concepción	Guarantor of the Chinese driver, Tan Tinco, for driving without an upper garment	One peso
Calisto Canasto	Ermita	Guarantor of the driver, Francisco Catido, for lacking registration documents of the vehicle	One peso

[104] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7526, Incidente sobre imposición de multas a las personas chino Tan-gueco y la india Macaria Buenviaje por poner sus tiendas a la vía pública, 17 de abril de 1875.

Pilar Guevara	Aguados	Guarantor of the driver, Jose Miranda, for lacking registration documents of the vehicle	One peso
Don Reducindo Peña	Ermita	For absence of a license/name plate in the *carromata*	One peso
Félix Ramírez	Ermita	For absence of a license/name plate in the *carromata*	One peso
Arcadio Castañeda	Ermita	For absence of a license/name plate in the *carromata*	One peso

Table 6: List of infractions documented by the 6th Subdivision of the Guardia Civil Veterana, October 1887.
Source: Costelo, 2020. Elaborated by using the data from AF-BTNT-CCHS-CSIC, Animales Sueltos[105]

This list reflects two of the common violations with regard street transit and circulation- the absence of proper documentation and the presence of stray animals in the streets. Aside from these, violations by native Indios and Chinese in Manila related to the proper conduct on street circulation such as overspeeding, reckless and uncontrolled driving, and a myriad other offense were commonly documented by the urban police. For example, on 19 April 1875 two teenagers (*muchachos*) named Nazario and Ezequil (the police report did not specify their surnames), residents of Sampaloc who work for the priest Don Telesforo Trinidad were detained for overspeeding (*por correr caballos en la calle*).[106] A similar case was reported when Fernando Batanco, an *indio,* was fined and apprehended for running over Alfonso Bautista on the morning of 21 April 1875 along Salazar Street in Trozo.[107] Disruption on public streets, , both caused by residents and animals, were also apprehended. For example, Balvino Ticoco, a wagon owner and resident of Aguila Street in Tondo and Benito Carubrang, his 20-year old wagon driver (*cochero*) were penalized for letting loose their horse that caused chaos in the Real Street of Tondo up to Escolta Street in Binondo.[108] Five individuals were also arrested when ¨at about ten o'clock in the morning they started shouting with their agitated voices and began running through the most public streets of the barrio of Dilao which disturbed the tranquility and order in public streets.[109]

[105] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7663 and Microfilm Roll 7527.
[106] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7526, Incidente sobre imposición de multa a los criados del Don Telesforo Trinidad por infracción del bando de policía sobre tránsito de animales por las calles, 19 de abril de 1875.
[107] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7526, Informe de José de Silva, teniente de la 4º subdivisión de la Guardia Civil Veterana, 22 de abril de 1875.
[108] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7451, Informe del teniente de Santa Cruz de la Guardia Civil Veterana, 17 de mayo de 1880.
[109] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7664, Informe de Juan Tacuray, capitán de la Guardia Civil Veterana, 21 de junio de 1878 (?).

The ambiguous delimitation between private and public spaces resulted to the constant contestation among animal owners and the municipal government. This ambiguity translated to the inconsistent implementation of urban norms and rules. For instance, it was typical for animal-owners to let their animals rest in the vacant spaces in front of their houses. This however clashed with the colonial government´s idea of efficient roads and streets. For instance, José Calzada, a resident of Tondo was fined for tying his carabao in front of his house. Calzada argued that it was his attempt, given the limited space that he had, to obey the regulation that no animal should be kept wandering around the streets. This reasoning was not accepted by the city authorities. They argued that the position where the animal was seized was still part of the space intended for public use and its presence supposedly disturbed the easy street circulation.[110]

Stray animals had to be cleared from streets because for the colonial government they pose threats and damages to houses, canals and water sources, cemeteries, pavements, and to crops and fields. Furthermore, the animals' manure, mixed with all sorts of garbage that invaded the cities, generated a morbid atmosphere that offended the changing sensibilities of the period.[111] Reports of the urban police from the 1860´s to the late years of Spanish rule revealed almost 900 cases of stray animals in Manila and its suburbs as seen in Figure 6.[112] The graph shows a significant increase in the detained number of animals beginning in the 1870´s perhaps due to the intensified efforts of the newly-reconstituted urban police in Manila. Meanwhile, the most number of detained stray animals in the 1880´s to 1890 reflect the heightened alarm against stray animals especially in this difficult decade characterized by waves of cholera epidemic.

[110] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7451, Informe de la Guardia Civil Veterana, 4 de agosto de 1873.
[111] Alzate Echeverri (2006), pp. 101-111.
[112] Definitely, there were more cases but only 900 are intelligible ones due to the very poor quality of the archival documents.

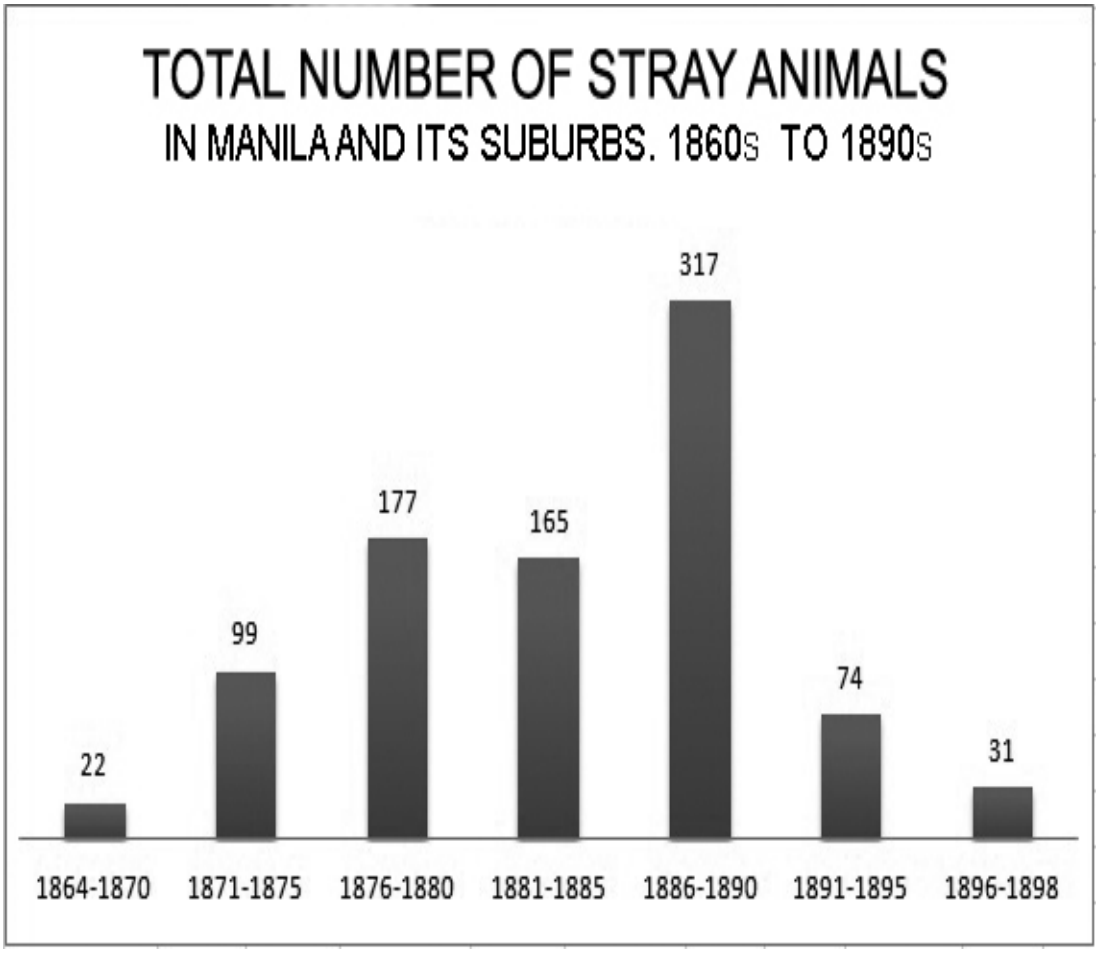

Figure 6: Total number of stray animals in Manila and its Suburbs, 1860´s to 1890´s.
Source: Costelo 2020. Elaborated by using the data collected and compiled from AF-BTNT-CCHS-CSIC, Animales Sueltos[113]

In fact, during the months of March and April 1882 which coincided the outbreak of the cholera epidemic, the colonial government ordered the strict prohibition of stray animals on public streets. On 13 April 1882, increased reports on the excessive number of roving animals in Quiapo, San Miguel and Sampaloc, principally pigs roaming around Tanduay Street in Quiapo, caused alarm among colonial authorities and residents not only because they impeded street circulation but more importantly by the possible public health risks they could bring. This concern led to the dissemination of public announcements (*bandillos*) and the imposition of bigger fines from the original one peso to five pesos for those owners whose animals would be caught roaming around the streets.[114]

[113] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7663 and Microfilm Roll 7527.
[114] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7526, Informe del Teniente Comandante del Guardia Civil Veterana de Sampaloc, San Miguel y Quiapo, 13 de abril de 1882 y 16 de abril de 1882.

Another aspect that could be extracted from this data is the distribution of animals that were detained in each arrabal as shown in Figure 7. The graph demonstrates that Sampaloc, Binondo, Ermita, and Tondo were the suburbs that had the most number of seized roving animals. Horses were the most numerous detained animals in Sampaloc and Ermita. This might be because these barrios had more fields (*sementeras*) so it was typical for animal owner to let their animals graze in these barrios. Meanwhile, numerous pigs were detained in Binondo, Tondo, and Quiapo- areas with a big concentration of natives and Chinese. Interestingly, there were a lot of stray goats that were detained in Intramuros. Spanish residents in the walled city might have been utilizing them to produce cheese, perhaps?

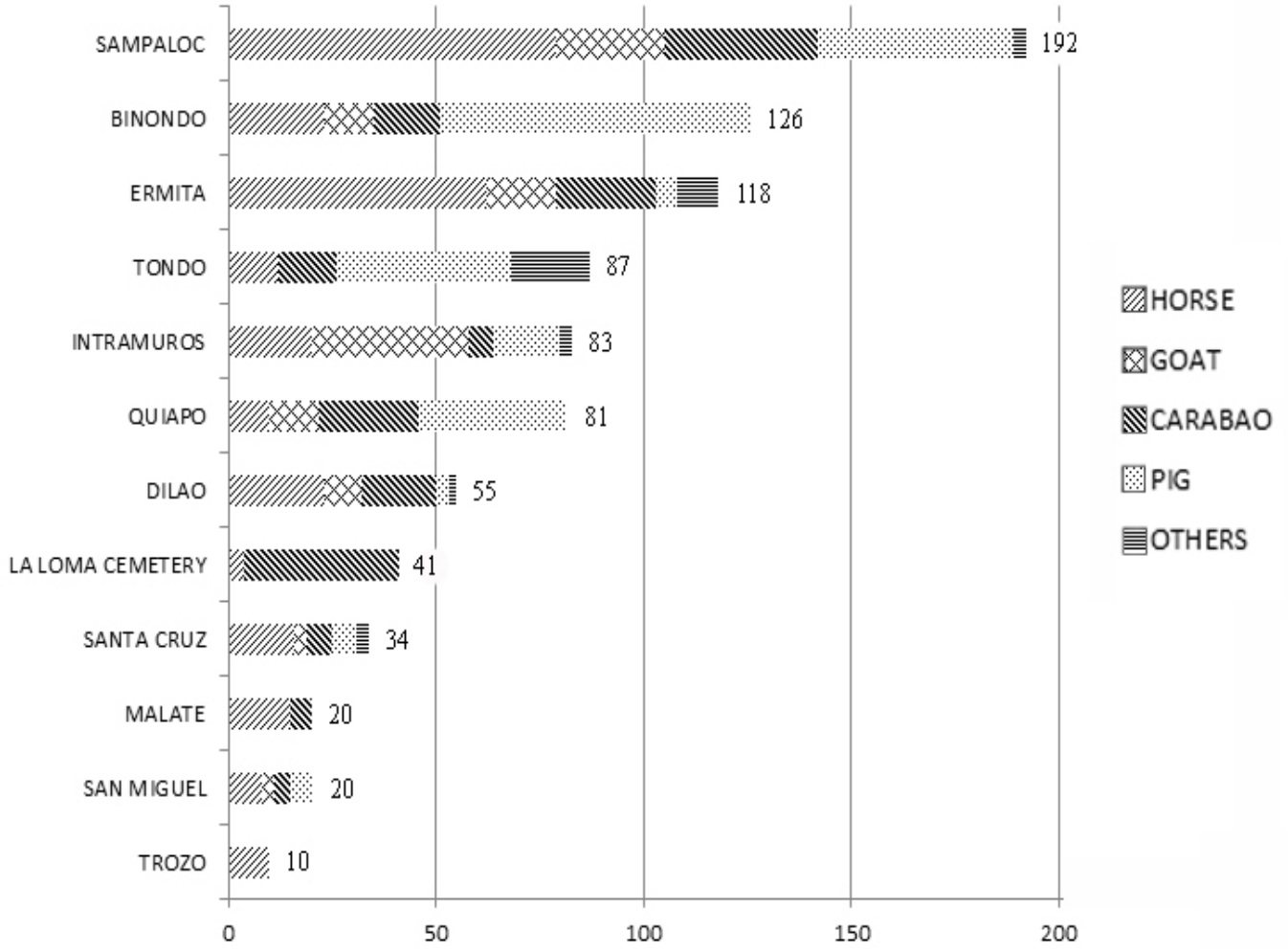

Figure 7: Distribution of stray animals per arrabal, 1860´s to 1890´s
Source: Costelo 2020. Elaborated by using the data collected and compiled from AF-BTNT-CCHS-CSIC, Animales Sueltos[115]

[115] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7663 and Microfilm Roll 7527.

There were also a number of animals detained, particularly horses and carabaos that were roaming around the La Loma Cemetery. One curious thing was that most of these animals were seized in the late 1870´s to the early 1880´s during the height of the cholera epidemic.

Chinese residents were normally penalized for violating decrees related to street sanitation and order, however theirs were more severe and exacting. For example, many Chinese were fined not only because they let their animals roam round the streets, many Chinese were also fined simply because they kept too many animals, specially pigs inside their houses *(¨por tener muchos cerdos en sus casas¨)*.[116] This practice of domesticating pig was also typical among natives; however, this infamy of Chinese being stereotypically regarded as pigs stemmed ¨not only because of their being Chinese but also because of their cramped and squalid living conditions commonly described as being ¨confined in dirty pigsties¨**.**[117]

Name	Domicile	Number of Pigs Encountered Inside the House
Gam-Tangco	Centro Viejo	2
Seng-Leongco	No. 6 Claveria Street	3
Go-Toco	No. 15 Lacorte Street	5
Chan-Tioco	No. 14 San Jacinto Street	25
Francisco Santiago	Concepcion Street	7
Chua-Tanco	Bustos Street	7

Table 8: List of offenders for the month of October 1879 for keeping too many pigs in their households.
Source: Costelo, 2020. Elaborated by using the data collected and compiled from AF-BTNT-CCHS-CSIC, Animales Sueltos[118]

Table 8 shows an example of the list of Chinese who were fined on the month of October 1879, their domicile, and the number of pigs that were detected in their houses.
These cases present that the sanitation agenda of the municipal government went beyond the public sphere of the street, and that in some cases the public and the private sphere were gray and ambivalent areas in the implementation of sanitary decrees and regulations.

As we can observe, most stray animals were horses, carabaos, cows, goats, and pigs. The colonial government imposed a one-peso fine to the owners of these stray animals. In some cases, the penalty was more severe if damages to public and private property were documented. This were the cases of Andres Francisco (Ermita) and Pedro Fernandez (Malate) when they had

[116] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7527, Informe de la Guardia Civil Veterana, 1 de octubre de 1879.
[117] Galang (2019), p. 76.
[118] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7663 and Microfilm Roll 7527.

to pay a four-peso fine because their carabaos damaged the garden and some properties of the Cavalry and the Artillery.[119] Most of these horses, cows, and carabaos were identified and claimed by their owners, and if not, these animals were sold in public auctions. Meanwhile, the goats and pigs were disposed to Bilibid prison and to orphanages and hospitals for consumption.

One stray animal that was so typical in the period is missing in this picture- the dogs. In the mid-nineteenth century, colonial officials were seriously preoccupied with the increase in number of stray dogs or *perros vagabundos*. The unruly roaming of dogs had already caught the eye of colonial officials since the late eighteenth century. However, the report of the central government on 8 December 1860 that these dogs caused an outbreak of hydrophobia, more popularly known today as rabies, changed the colonial policy with regard these animals. Earlier ordinances already prohibited the dogs from running at large specially in the public streets and spaces of the capital, but, archival documents show that beginning in the mid-nineteenth century there were at least three instances wherein the municipal government of Manila opted a severe policy dog cull. Motivated by fears of rabies, the government ordered the first mass extirpation of stray dogs from June 1861 to March 1862. The City Council undertook the acquisition of a poisonous substance which, if administered in small doses, can cause instant death to many animals. With a tone of urgency, the municipal government insisted on 7 June 1861 that 100 poisonous balls (*bolas venenosas*) be procured to arrest the increase of rabies cases specially during the hot months of the year. [120]

Two decades later, the municipal government of Manila again expressed concern on the disturbing and perilous number of stray dogs in the capital. In 1880, the city government sought the services of chemical laboratories to prepare strychnines (*estricnina*) to kill dogs. *Farmacia de Don Jacobo Zobel*, one of the leading if not the leading laboratories of the time, was commissioned to develop 1,000 *mataperros,* poisonous substance that came in the form of tablets that were specifically used to eradicate canine animals. [121] However, this amount proved insufficient because on 31 March 1883, the Corregidor de Manila decreed the utilization of municipal funds for the acquisition of 2,000 additional pills from the same pharmacy. [122] The street violence brought about by the mass extermination of dogs was too much even for the gobernadorcillos of the suburbs. On 20 April 1883, the four gobernadorcillos of Quiapo,

[119] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7663 and 7527.
[120] AHN, Ultramar, 5186, Exp.38, Compra de bolas venenosas para perros vagabundos, No.1 Carta del Ayuntamiento de Manila, 7 de junio de 1861.
[121] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7664, Informe del Corregimiento de la Ciudad de Manila, 27(?) de junio de 1880.
[122] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7664, Expediente sobre autorización del gasto para confeccionar las píldoras de estricnina o veneno mataperros, 16 de abril de 1883.

Binondo, Tondo, and Sampaloc, namely Antonio de los Santos, Enrique de los Santos, Roman Canlas and Tomas Benavides, unanimously called the attention of the central municipal government that they be somewhat ¨discharged¨ from this horrible task and that the *Guardia Civil Veterana* be given the entire responsibility of carrying out the act. The picture was so horrible that they said that ¨given the circumstances, it was impossible for the cleaning carts to collect all the dogs that were killed through poisoning¨. Such was the number of dead dogs in public areas that the residents themselves already called for the speedy collection and burial of the lifeless animals. [123]

The dog problem persisted even after the drastic measures by the municipal government as reflected by the re-publication of *Bando del Corregimiento de Manila relativo a los perros vagabundos* on 31 March 1885 which was earlier promulgated on 13 April 1877. According to the municipal government, the existence of stray dogs as well as the dog owners´ abusive behavior of allowing their animals to freely circulate along the streets and plazas of the Capital without any form of caution cause serious problems to the capital. The city authorities then ordered that only dogs with muzzles and tied to a strong chord and safe chain should be allowed in public spaces and streets. Furthermore, dogs should wear identification chains on their neck to differentiate them from stray dogs. Six days after the publication of this regulation in the *Gaceta de Manila,* the municipal government again started the extirpation of dogs without muzzles and identification chains that roam the streets and public spaces of the capital. Poisoning the canine animals was the municipal government´s idea of clearing the thoroughfares of these ¨dangerous animals¨. Garbage collectors and street sweepers were tasked to gather the remains of the dead animals and their burial near the bay.[124]

[123] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7664, Informe de los gobernadorcillos de Quiapo, Sampaloc, Tondo y Binondo, 20 de abril de 1883.
[124] ¨Bando del Corregimiento relativo a los perros vagabundos,¨ *Gaceta de Manila,* 31 de marzo de 1885.

G. Lighting and Embellishing the Streets

POT-POURRI
Last night in a pothole
I almost killed myself.
What things did I say about our
lighting contractor![125]

POT-POURRI
Anoche en un bache
por poco me mato.
¡Qué de cosas dije del que es
contratista de nuestro alumbrado!

In the case of Manila, it was clear that the three reasons of security, utility, and urbanity motivated the establishment of street lighting in the capital. Apart from the political and military interests of securing the city, the members of the economic sector who owned commercial establishments and growing industries pushed for the protection of their properties and possessions. Following the idea that ¨a good lamp is the best police¨,[126] perhaps putting order and deterring crimes were the most cited reason why there was a need to speckle the streets of Manila with public light. Nineteenth-century nights, including the nights of a rapidly urbanizing Manila, simply became busier. The period motioned the increased nighttime mobility of the city dwellers as well as the movements of carts and carriages. With street lights, nocturnal street traffic became easier. Night light brought the ¨nocturnalization of urban daily life¨[127]. As the century progressed, spectacles, performances, and new forms of leisure and entertainment drew the attention and interest of the urban residents. Furthermore, night light was an embellishment that marked a city in the path of modernization and progress.

During the administration of Governor General Rafael María de Aguilar, the lighting of streets was an essential part in the urban improvements of Manila. Streets need not only be paved, widened, aligned, cleaned, and cleared. The illumination of the thoroughfares and public spaces was an equally important reform measure for the capital. On 28 February 1797, the high government ordered the setting up of glass street lamps placed on iron pedestals. This measure, however, was first limited to Intramuros and its immediate environs like the select areas of

[125] ¨Pot-Pourri,¨ *Manila Alegre* no. 7, 1 de mayo de 1886.
[126] Mark Bouman, ¨The ´Good Lamp is the Best Police´¨: Metaphor and Ideologies of the Nineteenth Century Landscape,¨ *American Studies,* 32, 2 (Fall 1991), pp- 63-64.
[127] David E. Nye, *American Illuminations: Urban Lighting, 1800-1920* (Massachusetts: MIT Press, 2018), p. 16.

Parian. Similar to the pavement works during Aguilar´s term, the funds for street lighting came from the cloth tax and other alternative fund sources from the still then existing Galleon trade.[128]

The continued growth of the city during the first years of the nineteenth century made the authorities realize of the need to expand the street light service to the suburbs most especially to the commercially-active areas outside of the walled city. The Ayuntamiento de Manila wrote to the central government in the islands concerning its dilemma. While it recognized that the project would provide ¨personal security to the inhabitants, safeguard to their houses, and comfort and salubrity to the entire city¨ (*la seguridad personal de sus habitantes, la custodia de sus casas y la comodidad y la salubridad de todo el pueblo)*, it warned that the local funds appropriated for street construction and improvements were already drained to cover all the escalating costs.[129]

The city council remarked that the government could easily compel residents owning high houses with windows facing the street to hang lanterns to cast brightness to the thoroughfares. It added that the compliance of the residents could be achieved if fines were to be imposed for non-obedience to this measure. An order could be promulgated ordering that the lamps should be placed in each house at a certain distance to illuminate the street symmetrically. The Ayuntamiento mentioned that this was practiced in Mexico in a Royal order on 10 February 1786 and residents who refused to comply were pressed by the mayors of the neighborhood. In case of continued resistance, these belligerent inhabitants would be required to move out of the barrio as they were considered useless and damaging neighbors.[130]

However, the Ayuntamiento remarked that the solution for Manila´s street lighting problems needed more than just a simple implementation of an order that existed in Mexico. It said that placing window lamps would have been plausible if the intended district was only Intramuros. The city council noted that more than the walled city, public illumination was actually more necessary on the streets of the Extramuros. Reports of numerous robberies and other excesses were believed to be common in these suburbs inhabited by a multitude of people.

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[128] AGI, Estado, 46, No. 36, Gobernador de Filipinas sobre alumbrado de Manila. Carta número 29 del Gobernador de Filipinas, Rafael María de Aguilar dando cuenta del establecimiento del alumbrado en la ciudad de Manila y propone los medios para crear un fondo con que sostener este objeto, Manila, 28 de febrero de 1797.

[129] AHN, Ultramar, 5153, Exp. 3, No. 1, Expediente del Ayuntamiento de Manila sobre el alumbrado de ella y gasto de policía se imponga la contribución de un real y medio para vara de frente de los edificios de la ciudad y sus extramuros, Manila, 28 de julio de 1814.

[130] AHN, Ultramar, 5153, Exp. 3, No. 5, Testimonio literal del expediente creado sobre el alumbrado de Manila, 2ª vía, 4 de diciembre de 1801. The words used were ¨como vecino nocivo e inútil.¨

The authorities also believed that many fires that devastated entire neighborhoods in the city were carried out by malevolent individuals who were under the cover of the darkness of the night.[131]

Hoping that the lights would dispel this generalized disorder of darkness, the *Consulado de Manila*, appropriated 1,500 pesos for the project of putting up and improving the street lights in the capital. In one of the letters on 4 December 1801, the Ayuntamiento reverberated the thoughts of the Consulado de Manila that:

> [the] lamps could serve as night watchmen (rondines) that would take care of the safety of merchant houses, prevent thefts, fires, deaths, and other crimes that are committed so often outside the walls; that through these lamps the shadow of the night and the excesses it brings would be dispelled, and that security, order, and public tranquility would be restored permanently in these populous neighborhoods that have been often been under the greatest vigilance and conflict with public authorities.[132]
>
> *[los] mismos faroles podrían servir de rondines para cuidar de la seguridad de las casas de los comerciantes, evitar los robos, incendios, muertos, y otros delitos, que se cometen con tantas frecuencia en el extramuros, que con estos celadores y quitadas las sombras de la noche con el alumbrado que tanto han contribuido a favorecerlos se extinguirían de una vez estos excesos y quedarían restablecidas para siempre la seguridad y quietud pública de unos barrios tan populosos que han puesto muchas veces en el mayor cuidado y conflicto al vecindario y a las autoridades públicas.*

Apart from the absolute necessity of preventing accidents and recurrent burglary, the city´s authorities also expressed its commitment to demonstrate to the entire inhabitants of Manila and the foreigners that frequented the port city that in a colony so remote as the Philippines, the city´s illumination could evoke great honor to the government and the nation.[133] In effect, streetlights aside from being useful guideposts and means to control disorder, were viewed as elegant street embellishments and ornaments that booster the image of urbanity, progress and civilization. The Consulado and the Ayuntamiento, fearful that a dark and gloomy night would suddenly appear to a city that was already in possession of being illuminated with order and symmetry (*que de un golpe aparezca una noche obscura y lóbrega a una ciudad que*

[131] Ibid.
[132] Ibid.
[133] AHN, Ultramar, 5153, Exp. 3, Expediente del Ayuntamiento de Manila sobre el alumbrado de ella y gasto de Policía se imponga la contribución de un real y medio para vara de frente de los edificios de la ciudad y sus extramuros, No. 5, Testimonio literal del expediente creado sobre el alumbrado de Manila, 2ª vía, 4 de diciembre de 1801.

está en posesión de estar iluminada con orden y simetría) were in unison of imposing a ¨moderate tax¨ (*imposición moderada*) for the city´s public lighting.[134]

Motivated by the need to ¨uncover the darkness of the night¨ (*quitarse la oscuridad de la noche*) on one hand and the insufficiency of municipal funds on the other, the municipal government decreed that the residents should contribute to the public coffers dedicated for public lighting. As a result a a tax was imposed to the residents of the capital. One and a half *real* was collected for each *vara*[135] (yard) of the resident´s houses to sustain the project of street lighting and cleaning. The government tried to justify this new form of tax and said that ¨the resident owners come to contribute, in proportion to their resources, to an objective that is in turn converted for their own benefit¨ (*los vecinos propietarios vienen a auxiliar proporcionalmente a sus facultades para un objeto que se convierte con propio beneficio*).[136] On 7 November 1817, the King affirmed this municipal disposition through a Royal Cedula stating that all house owners and lessees be obliged to pay this municipal tax.[137]

By the first decades of the nineteenth century, public lighting was extended beyond Intramuros to the flourishing and commercially-booming areas of Binondo and, later on, to some parts of its adjacent suburb of Santa Cruz. It should be noted that this public lighting started not with the installation of modern street lights, but of lamps fuelled by coconut oil (*faroles de aceite de coco*). Coconut oil served as the principal energy for lighting in the capital before the advent of other energy sources such as kerosene, gas, and electricity. Even until the end of the nineteenth century, John Foreman remarked that

> Every dwelling, rich or poor, consumes a certain amount of oil nightly for lighting… There is scarcely a single dwelling-house, without a light of some kind of burning during the whole night in expectation of a possible earthquake, and the vast majority use coconut oil because of the economy.¨[138]

[134] Ibid.
[135] The closest approximation to this Spanish measurement would be one yard.
[136] AGI, Filipinas, 509, R.1, N.6, Duplicado de carta de José de Gardoqui sobre contribución para alumbrado, Carta del Ayuntamiento Constitucional de Manila, 28 de julio de 1814.
[137] AHN, Ultramar, 5191, Exp. 14, Impuesto municipal a las casas de varios pueblos para el alumbrado y barrido o limpieza de las calles, No. 6, Real Cedula de 7 de noviembre de 1817.
[138] John Foreman, *The Philippine Islands: A Political, Geographical, Ethnographical, Social and Commercial History of the Philippine Archipelago.* 2nd edition (Kelly & Walsh, Ltd., 1899), p. 358.

Coconut oil was sourced from the provinces south of Manila. In Laguna, Infante-Tayabas, and Batangas, coconut planting was exclusively done for coco oil extraction.[139] Doeppers documents that in the town of Pagsanjan alone in the province of Laguna recorded around 200 coconut oil presses in 1865.[140] When public contracts were granted for the lighting of the capital´s streets, the Ayuntamiento would specifically identify that only coconut oil from the areas of Laguna and Tayabas be used because of their superior quality.

By the mid-nineteenth century, public lighting was extended to the rest of the suburbs on the right bank of the Pasig river like Quiapo, San Miguel, Sampaloc, and some parts of Tondo. On 23 December 1859, the Ayuntamiento ordered that residents of these suburbs should pay the street lighting and cleaning tax. Only houses or buildings made of stone and masonry or a mix of stone and wood would be taxed. Houses made of nipa and light materials were to be exempted. Some local officials expressed the uncertainty of collecting the sufficient amount since in areas heavily populated by natives, there was still a slow increase of houses made of heavy construction materials.[141]

In 1862, the municipal government undertook a comprehensive inspection and documentation of all the names of proprietors who paid the street lighting and cleaning tax of one and a half *real*. A total of more than 1,000 names were documented, including their addresses (street number and street name), the measurement of their homes and properties in terms of *varas,* and their corresponding taxes. Some of the residents who paid the tax were Doña Maria Romana Bernardo, Doña María Versoza de Sunico, Don Mauricio Balbino[142], the Paternos, and 28 more other residents of Anloague Street. The propietors of this street paid around 300 pesos of tax. Prominent families involved in the colony´s commerce and trade such as the Tuasons, Barrettos, Roxas´ and 35 more house owners in Escolta Street paid around 450 pesos while Don Modesto de Castro[143], an owner named El Chino Mariano, and 45 other

[139] Ibid., See also the extensive discussion on the province´s agricultural industry in Rhina Alvero Boncocan and Dwight David Diestro, *Nineteenth century conditions and the revolution in the Province of Laguna* (Diliman, Quezon City: University of the Philippines, Center for Integrative and Development Studies, 2002).
[140] Daniel Doeppers, ¨Home Fuel in Manila, 1850-1945,¨ *Philippine Studies,* vol. 55, no. 4 (2007), p. 433.
[141] AHN, Ultramar, 5191, Exp. 14, Impuesto municipal a las casas de varios pueblos para el alumbrado y barrido o limpieza de las calles, 1859-1864.
[142] Perhaps the same Balbino Mauricio who was wrongfully implicated in the 1872 Cavite Mutiny and was deported to the Marianas Islands?
[143] Perhaps referring to Fr. Modesto de Castro (1819-1864), a Filipino priest born in Biñan, Laguna who authored ¨Urbana at Feliza¨?

residents in Joló Street also remitted the same tax. These and many other more residents of almost fifty streets and plazas including IlangIlang, Jaboneros, Joló, Sto. Cristo, Vives, Trozo, etc. paid the contribution for public lighting.[144] Their complete names, addresses, and other details are documented in Appendix Chapter 4, C. This list, if examined, reveals the personalities who moved around Manila´s prominent political and socio-economic circles.

Meanwhile, Table 7 and Figure 8 is a summary of the list of streets that were lighted, as compiled from the different taxes that were collected by the government from the city residents. After locating, identifying, and plotting these streets on the map, the data reaffirms that premier access to street lights was given, first, to Intramuros- the political and religious center of the colony and, second, to Binondo and its bordering streets in the barrio of San Nicolás, Tondo, and Santa Cruz- areas of commercial importance where industries, establishments, and dense populations were located. However, this service was still nonexistent in the interior areas of Tondo where the majority of the natives resided.

Streets in Intramuros		**Streets in Extramuros**	
Arzobispo	Recoletos	Anluague	Olivares
Audiencia	Solana	Barraca	Plazuela de Dª Jacoba
Anda	San Juan de Letrán	Andén de la Barraca	Rosario
Beaterio	San Juan de Dios	Caballero	Callejón del Rosario
Basco	San Francisco	Carenero	San Gabriel
Baluarte	Sta. Potenciana	David	San Jacinto
Cabildo	San Agustín	Escolta	Sacristía
Hospital	San José	Ilangilang	San Vicente
Legaspi	Santo Tomás	Jaboneros	Suspiros
Magallanes	Santa Lucía	Joló	San Fernando
Mercado	Victoria	Callejón de Pereyra	Santo Cristo
Muralla		Longos	Callejón del Santo Cristo
Palacio		Murallon	Segunda Calle de Santo Cristo
Fuerza		Calle Nueva	Tercera Calle de Santo Cristo
Real		Callejón de la Calle Nueva	Plazuela de Vivac
			San Nicolás

[144] AHN, Ultramar, 5191, Exp. 14, Impuesto municipal a las casas de varios pueblos para el alumbrado y barrido o limpieza de las calles, No. 10, Relación de las casas de la ciudad de Manila que pagan la contribución de la limpieza y aumbrado, mandado por la Real Cedula de 7 de noviembre de 1817.

			Trozo

Table 7: Summary of the list of streets that were lighted, as compiled from the different taxes that were collected by the government from the city residents in 1862.
Source: AHN, Ultramar, 5191, Exp. 14[145]

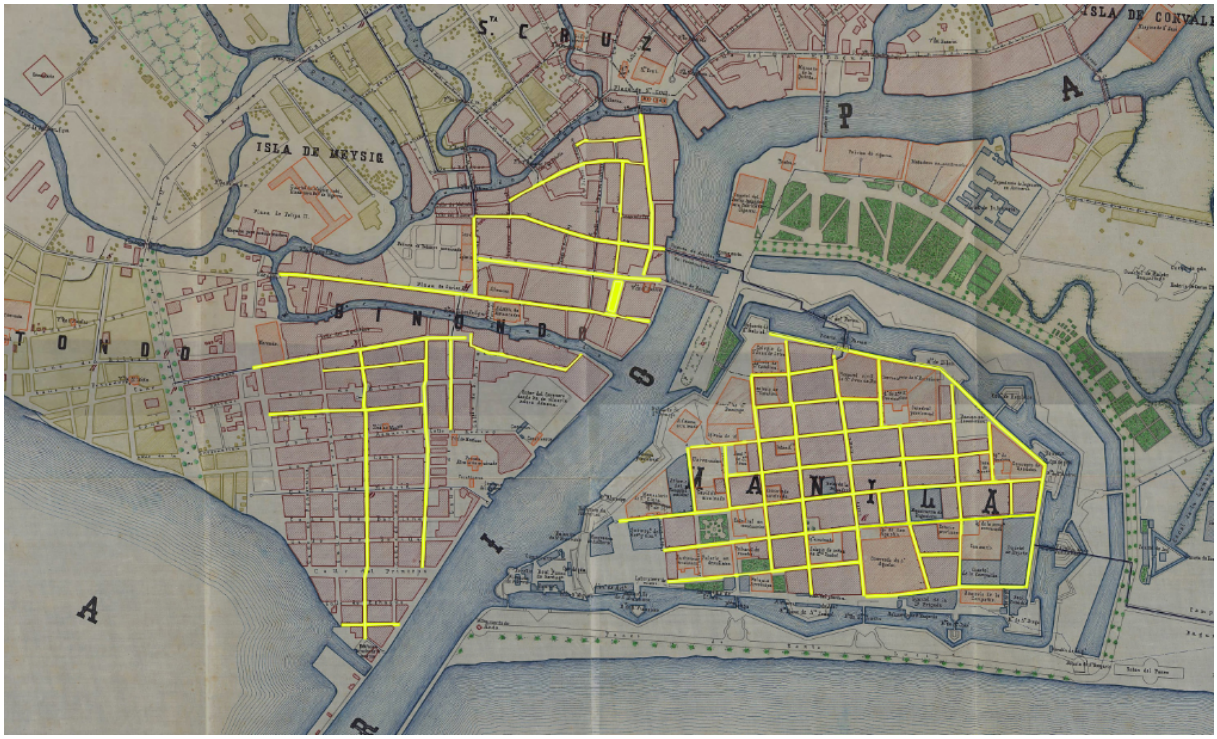

Figure 8: Map of Intramuros (Manila) and parts of the Extramuros with street lamps according to 1862 data. The data was plotted in an 1878 map. suburb of Binondo. The streets with yellow lines were the first areas where public lampposts were installed.
Source: Costelo, 2020. Elaborated by using the data collected from AHN, Ultramar, 5191[146] and a map authored by engineer Genaro Palacios, 1878.

As the century progressed, the Ayuntamiento endeavoured the improvement of street lighting by establishing bid specifications to standardize the carrying out of this urban service. Contractors were expected to light the lamps from 6:00 o´clock in the evening to 5:00 o´clock in the morning. They were expected to use high quality coco oil and obliged to maintain the cleanliness and good state of the lamps especially during typhoons. Fines were to be imposed should the contractor fail in delivering good lighting service. The city council also struggled to place more night lights in the capital.

[145] AHN, Ultramar, 5191, Exp. 14, Impuesto municipal a las casas de varios pueblos para el alumbrado y barrido o limpieza de las calles, 1859- 1864.
[146] AHN, Ultramar, 5191, Exp. 14, No. 10, Relación de las casas de la ciudad de Manila que pagan la contribución de la limpieza y aumbrado, mandado por la Real Cedula de 7 de noviembre de 1817.

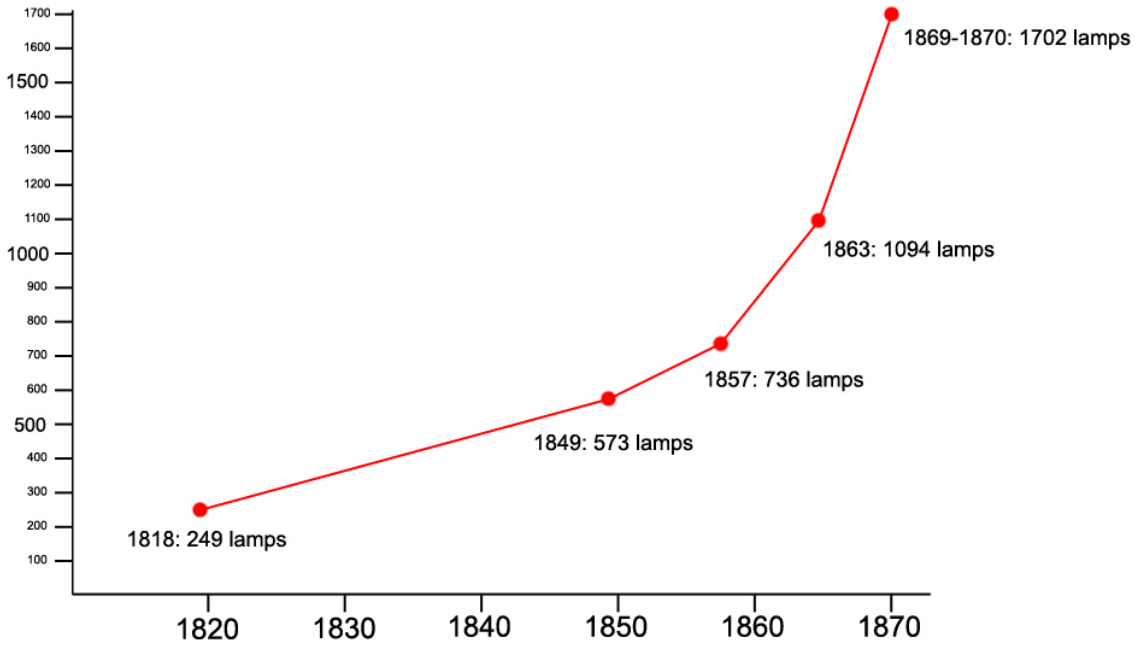

Figure 9: Number of Lampposts Installed in Manila and the Suburbs from select years of 1818, 1849, 1857, 1863, and 1869-1870.
Source: Costelo, 2020. Elaborated by using the data collected from AHN, Ultramar, 5191, Exp. 14 and AHN,Ultramar,5224,Exp. 2.

Figure 9 is a representation of the total number of street lamps reported by the Ayuntamiento for the years 1818, 1849, 1857, 1863, and 1869-1870. It that from 249 lamp posts in 1818, the numbers grew to 1,072 lamps that illuminated the streets in 1869-1870. It reflects the very slow increase of the number of lamp structures in the capital within a span of three decades from 1818 to 1849 with only 324 lamps added. In the 1860s things would start to improve as a reflection of the heightened preoccupation of the government to provide municipal services. 358 additional lamps were installed in a span of six years from 1857 to 1863. Moreover, a 70% increase was observed in a span of six years from 1863 to 1870. If not fueled by coconut oil, some of these lamps were powered by kerosene or petroleum. A recurring problem for the Ayuntamiento was appropriating funds for coconut oil due to its fluctuating price. Kerosene or petroleum, on the other hand, was an imported energy source.

Despite the lack of municipal funds, the municipal government continued to embellish the public streets, parks, and paseos with street lights in the second half of the nineteenth century. The social function of light was witnessed with the increasing number of nocturnal public celebrations, performances, and gatherings. Lighted public spaces as a sign of modernity was the motivation when on 11 March 1859 the Ayuntamiento de Manila exalted the approval

of the colonial government on the installation of additional 96 lamp posts to be placed in the Paseo de Isabel II even though it meant additional costs for the government.[147] During the same year, it was also reported that the lighting costs for the Paseo de Bagumbayan increased to 1,430 pesos due to the additional lampposts in the said area. According to the budget, each lamppost costs 14 pesos and 7 reales.[148] Using this data, it could be estimated that there were around 100 streetlights in Bagumbayan during this year. With these night lamps, night performances and spectacles became a common feature of the city life. This was not the case in the late eighteenth century to the early nineteenth century when streets were only lighted at night during important political and religious holidays and events. Other forms of entertainment such as theatre productions were also shown even at night. For instance, when the city´s waterworks project was inaugurated in 1882, some week-long nightly musical performances were shown in the ¨extraordinarily lit¨ (*extraordinariamente iluminada*) plazas and *paseos* of Manila. Grand *serenatas* by all civic and military bands in the *paseo* de Luneta were opened to the public. After the performances, fireworks display took place for three consecutive nights. *Teatro Tondo* and *Teatro Filipino* presented week-long performances to the public for free. At the same time, a high-society ball was held in the *Teatro de Variedades.*[149]

The street illumination project formed part of the bigger beautification venture of inside and outside the walls of the city. During the dry season of 1859, Manila´s urban police reported the withering state of the plants and trees in the city´s *paseos* and gardens. The commission urged the replanting of new plants and trees before the rainy season started during that year.[150] In May 1859, city councilors Jose de la Herran, Alonzo Pleyga, Alejandro Roces, and Francisco Reyes reported the appropriation of 739 pesos for the municipal government´s reforestation project of the wooded areas (*arbolado seco)* of the *paseos* and plazas of Sta. Lucia, Bagumbayan, and Plazuela de Magallanes. The project which involved the planting of indigenous trees such as *manga, sampaloc, santor (santol), lomboy, nara, ylanilan (ilang-ilang)* in the *paseos,* plazas and the roadway leading to the barrio of Paco was considered necessary

[147] AHN, Ultramar, 5173, Exp. 14, Aprobado gasto de alumbrado del Paseo Isabel II en Arroceros, Carta del Ayuntamiento de Manila al Gobierno Superior Civil, 11 de marzo de 1859.
[148] AHN, Ultramar, 5173, Exp. 27, Gasto para el alumbrado del Paseo de Bagumbayan, 1859.
[149] Francisco Mas y Otzet, *Carriedo y sus obras: memoria de las obras pías de los pobres y de las aguas instituidas por Don Francisco Carriedo y Peredo y crónica de los festejos que el Ayuntamiento de la Ciudad de Manila ha celebrado para conmemorar la inauguración de la primera fuente de aguas potables* (Manila, Establecimiento Tipográfico de Ramírez y Giraudier, 1882), pp. 89-92.
[150] AHN, Ultramar, 5173, Exp. 67, No. 1, Autorización de gasto de 739 pesos para la reparación del arbolado seco de las plazas y paseos de Manila, Informe de la Comisión de la Policía del Excelentísimo Ayuntamiento en Extramuros, Binondo, 19 de mayo de 1859.

to bring back to life the greenery in the capital. An additional budget was also appropriated for the bamboo fences placed around the replanted trees to protect the new buds. In total, 400 trees were reported to be replanted in the Paseo de Sta. Lucia, 150 in Bagumbayan, and 67 in Plaza de Magallanes.[151] Governor General Norzagaray lauded this municipal project ¨not only for the betterment of the public ornate and the environmental conditions of the capital but as a constant zeal towards the colony´s development and progress¨.[152] During this period, other public lighting projects were simultaneously undertaken in other towns outside of Manila like in the principal towns of Pampanga such as Guagua, Bacolor, San Fernando and Mexico.[153]

More embellishment projects were put in place towards the latter part of Spanish rule in Manila such as the Paseo Maria Cristina project in 1886. Juan José Hervas, the assigned architect, designed the establishment of gutters (*cuneta*) and sewage in the entire extension of the Santa Lucia seaside. Aside from this, small parks and English-style gardens were projected along the avenue. On 31 March 1886, Huevas reported that the entire avenue was already mowed and straightened and prepared for the construction of pavements and little gardens. Prisoners were sent to undertake the excavation work and to minimize government spending, old stones from the ruins of the Malacañan Palace reconstruction were utilized in the embellishment of the sidewalk.[154]

First attempts to modernize the street lights: The difficult shift to gaslights

Beginning in the 1860s emerging ideas and technologies that changed many cities around the world started to penetrate the colony. One of these was the increasing call for a shift in the technologies used in illuminating the streets and public spaces of Manila. In the 1860s to the 1880s, the Ayuntamiento received several proposals from different Spanish and transnational companies to commence the transition from oil-powered lamp posts to street lighting through gas. British and American cities were the leading innovators of this technology in the nineteenth century. It was said that every British city had already established gaslighting

[151] AHN, Ultramar, 5173, Exp. 67, No. 2, Arreglo del arbolado de plazas y parques de Manila, Informe del Ayuntamiento de Manila, 26 de mayo de 1859.
[152] AHN, Ultramar, 5173, Exp. 67, No.3, Arreglo del arbolado de plazas y parques de Manila, Informe de la Junta Directiva de la Administración Local, 25 de junio de 1859.
[153] AHN, Ultramar, 5173, Exp. 45, Mantenimiento del alumbrado en pueblos de Pampanga, 1859.
[154] AHN, Ultramar, 521, Exp.12, Proyecto del Paseo María Cristina en la playa de Santa Lucía presentado por el Corregimiento de Manila, Memoria del Arquitecto, 31 de marzo de 1886.

systems by the 1820s.[155] The first Spanish city to introduce gaslights was Barcelona in 1842 while still maintaining some of its traditional oil lamps.[156] In 1861, Barcelona´s streets had 1, 957 gas lamps and 1, 297 oil lanterns.[157]

While most of the gaslight propositions did not materialize in Manila, a survey on what consisted these tenders provides a glimpse on the different themes concerning not only public lighting but public works in general—themes that ranged from the political, economic, sanitary, security and ideological conditions and preoccupations of the society, techo-scientific ambiance, and the movement of knowledge transfers during this period.

As early as 1861, proposals were already underway. On 20 December 1861, English engineer Gualterio Spencer, under the bond of the Russel and Sturgis commercial house based in Manila, applied for a license to explore and establish a gas manufacturing company. Spencer asked for a privilege of 15 years for such exclusive exploitation. According to official reports, the Manila government actually expressed support to this project as shown in the many reports and correspondences leading to the appropriation of 20,000 *duros* for the project. According to reports, the central government only needed to be reminded of the 3 June1863 earthquake to recognize the urgency of the project. The kerosene and oil lamps dispersed on the capital´s streets produced dim and unreliable light. Improving the lamps´ brightness and stability was indispensable especially during the typhoons and earthquakes. The Ayuntamiento asked:

> Do we need to paint the heartbreaking picture of Manila on the night of 3 June 1863 that surprised its inhabitants in the dark? Is such an event believable in a country that prides itself as civilized? Unfortunately, it is very true. That night was one of the many marked night that the public lighting did not turn on! And if the moon had not appeared shortly after the great catastrophe, who knows of the [further] tragedies that would have increased the number of those known?
>
> *¿Acaso tendremos necesidad de pintar el cuadro desgarrador de Manila en la noche del 3 de junio de 1863 que sorprendió a sus habitantes a oscuras? ¿Se concibe semejante hecho en un país que blasona de civilizado? ¡Aquella noche era una de las muchas señaladas para que el alumbrado público no se encendiese! Y de no haber*

[155] Nye, p. 35.
[156] Mercedes Fernández-Paradas, ¨La regulación del suministro de gas en España, 1841-1936,¨ *Revista de Historia Industrial,* no. 61, Año XXV (2016), p. 49 pp.49- 78.
[157] José Ignacio Muro Morales, ¨La Red Eléctrica y el Alumbrado Público en Barcelona,¨ *Actas del Simposio Internacional Globalización, Innovación, y Construcción de Redes Técnicas Urbanas en América y Europa,* Universidad de Barcelona Facultad de Geografía e Historia (23-26 de enero 2012), np. Meanwhile in 1881- 1882, the first proposals and materialization for the electrification of Barcelona´s streets took place.

aparecido la luna poco después de la gran catástrofe, ¿quién sabe las desgracias que hubieran aumentado el número de las conocidas?

The authorities with the IGOP mentioned that gaslights could indeed be seriously considered given the exploitation improvements in the Cebu coal mines in the mid-nineteenth century. In 1852, carbon deposit was discovered by Spanish military engineers which propelled government interests to explore the mining potential of the island. Furthermore, the military engineers also eyed other prospective sites in the coastal areas of Luzon for the development of coal mines. The Spanish government, at one point, believed in the strong potential of this mining exploration. However, its quality was found to be inferior to those imported from Australia and England. This and the lack of interest from possible investors and technological mechanisms halted the development of the local mining industry.[158] For most of the second half of the nineteenth century, the importation of coal from Australia, England, and Japan was undertaken by the principal nineteenth-commercial houses in Manila such as Russel and Sturgis, Aguirre, Smith Bell, Holiday Wise, Guichard, etc. This raw material was mostly sourced out from Australia and Japan. Aside from lighting the streets, coal was essential in the many big public works projects in the second half of the nineteenth century such as the waterworks projects and the operation of the burgeoning companies in the capital involved in the shipping industries and, later, the establishment of new factories in Manila dedicated to the manufacturing of oil and beer.[159]

Almost six years after Spencer´s first proposal, the Superior Civil Government granted the tender on 1 February 1867. It included the installation of 220 lamps on the Paseo de la Calzada and Santa Lucia with an installation cost of 14,000 pesos and a maintenance cost of 33.24 pesos for each lantern per year. The lamps were supposed to be kept burning for ten hours at night, consuming five cubic feet of gas per hour.[160] Despite the perceived enthusiasm and plausibility of the project, the first gaslights project did not materialize in Manila. According to the colonial government, Spencer was unable to meet the requirements of forming the gas company.[161]

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[158] Isabel Rábano, ¨Encuentros y Desencuentros con la Metrópoli: La Inspección General de Minas de las Islas Filipinas y sus Ingenieros,¨ *Illes i Imperis,* 22, *Dossier ¨Ciencia e Ingeniería en Filipinas a fines del Siglo XIX* (2020) in press.

[159] María Dolores Elizalde, ¨Interacciones empresariales entre las elites urbanas Filipinas: Barcos, tranvías, cervezas y aceites¨ in María Dolores Elizalde and Xavier Huetz de Lemps (eds), *Filipinas, Siglo XIX. Coexistencia e interacción entre comunidades en el imperio español,* Madrid: Ediciones Polífemo, 2017*,* pp. 65-98.

[160] AHN, Ultramar, 5224, Exp. 2, Documento sobre la propuesta de Gualterio Spencer, 20 de diciembre de 1861.

[161] Ibid.

The second one came in the year 1869 when initial correspondences were made between Alejandro Newton, Director of the Gas Company of Hong-Kong and China (*Compañía de Gas de Hong Kong y China*) and the government in Manila. The government in Spanish Manila requested data on how gaslights were carried out in the British colony of Hong Kong.[162] In a letter on 14 August 1869, Newton sent to the Manila city government the specifications of its public lighting contract in Hong Kong including the lamp design, lighters, energy consumption, price and other pertinent information for the latter´s reference.[163] Similar to Spencer´s presentation, nothing final was concretized from this plan.

The third proposal came in 1871 from José Juan Watson with registered domicile in London and Paris. This proposition urged then Governor general Rafael Izquierdo to request reports from the Spanish consuls in Hong Kong and Singapore to provide data on the services that existed in the two neighbouring colonies and information concerning the number of gas lamps and the distance to which they were placed, the amount of coal consumed per lamp per hour, the resources and materials needed and their sources, and the taxes imposed by these governments to offer the service.[164] By this time, the Gas Company of Singapore was already servicing 374 gaslights in Singapore´s streets utilizing coal from Australia and England. Meanwhile, the Gas Company of Hong Kong and China was servicing 532 gas lamps using coal from Australia. A rich exchange of technological know-how took place during this venture. The Spanish government in Manila disapproved Watson´s recommendations for three reasons: the studies provided by the consuls showed that the price offered by Watson was much more expensive than the existing systems in Singapore and Hong Kong, the exclusive contract that Watson was applying for was too much of a period, and lastly, the limited funds of the colony to take in an expensive project. No less than Izquierdo himself expressed that the colony should think of ways to increase the municipal and central funds because without these, indispensable projects towards the colony´s progress could never be materialized.

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[162] AHN, Ultramar, 5224, Exp. 2, Documento sobre la propuesta de la Compañía de Gas de Hong Kong y China.
[163] AF-BTNT-CCHS-CSIC, Alumbrado, Microfilm Roll 1774, Copia del contrato celebrado el 23 de diciembre de 1965 entre Alejandro Newton, director de la Compañía de Gas de Hong Kong y China, por una parte; y Wilberforce Wilson, Inspector General interino de la colonia de Hong Kong, por otra, 14 de agosto de 1869.
[164] AHN, Ultramar, 5224, Exp. 2, Carta de Rafael Izquierdo a los consules de Hong Kong y Singapore, 18 de mayo de 1871. In the words of Izquierdo: *¨Los estudios pudiera dar la norma del establecimiento directo del alumbrado de gas en Manila y sus arrabales a semejanza del servicio que existe ya en las vecinas colonias de Hong Kong y Singapore, cuyas condiciones ofrecen una gran analogia, por las circunstancias especiales de estos pueblos y de su aparrada situación geográfica, con la capital de Filipinas¨*

Another proposal came in 1873 from Don Eduardo Brioso and Don José Fábregas with domicile and business ventures in Hong Kong. Fábregas himself came to Manila to present the plan but the IGOP immediately turned it down due to the plan´s lack of clarity. During the same year, a more serious offer came from a certain Don José Ramon de Villalon, a resident of Santiago de Cuba who proposed the following.[165]

(1) Villalon´s company would establish public and private lighting in Intramuros, and later in the suburbs, composed of 250-300 lanterns with one burner each. These lamps were said to offer great improvement from the oil lamps. According to the proposal, these produced a much more vivid, constant, and balanced light which could extend up to 40 to 50 yards in distance.
(2) On dark nights due to the absence of the moon, the contractor will light the lanterns at dusk and turn them off at dawn. On brighter nights, they will be lit until depending on the rising and setting of the moon. The consumption of each burner could be regulated according to the city council's approval.
(3) The cost of the appliances, pipes, machines, instruments and other necessary tools required the city government to pay in cash an initial amount of 50,000 pesos to be paid in a span of 10 years. The company will supply gas to private and public buildings at the rate of one and one-eighth peseta per cubic meter. Gas meters will be installed for this service.
(4) The company will shoulder the costs and expenses of the fabrication and installation of pipes from the streets to the burners of lamps. However, the rest of the lines leading to the private homes and properties should be shouldered by the individual consumer.
(5) For the installation of the gas pipes, prisoners or corveé labor will be utilized in the construction project.

For more than a decade (1861-1873), the colonial government, with the technical supervision of the IGOP, received and examined not less than five propositions. From the technical viewpoint of the engineers of the IGOP, the need to shift from oil to gas lamps was already due. The lighting from the oil and kerosene lamps was insufficient due to its average quality and the imperfection and primitiveness of its lighting devices. Several times did the engineers mention the instability of these structures in time of catastrophes that were so frequent in the colony.

From the sanitary and public hygiene perspective, sanitary professionals expressed the possible harmful effects of oil lamps to the residents. As early as 1857, military doctor Antonio Codorníu y Nieto who was secretary of the Junta de Sanidad from 1851-1856, wrote that the

[165] AHN, Ultramar, 5224, Exp. 2, No. 2, Propuesta de Don José Ramón de Villalón, natural de Santiago de Cuba al Ayuntamiento de Manila, 13 de octubre de 1873.

substandard oil used in some lamps produced an uncomfortable and acrid odor that normally cause coughing, chest tightness and even severe headaches. This problem was more serious among natives who could not afford good-quality oil. The natives had lamps called *tinjoi* wherein in its bottom half-burned deposits gathered over the days, which increased the emission of harmful airs. In the absence of oil-lamps, the natives also practiced the burning of small fires at night to produce light and to drive the insects away. The piled up garbage served as firewood resulting in a fetid smoke that normally caused strong acrid sensations in the throat. Codorníu noted that the small fires were at least tolerable in districts with nipa houses because while these provided the advantage of eradicating the daily waste of the households, the good ventilation of the nipa homes neutralized the presence of the stinking smoke and air. The military doctor warned that this was not the case in the many cheap apartments (*posesiones*) of Binondo and the other dense suburbs of the capital. Authorities prohibited the burning of small fires in these dwellings. As a consequence, the natives and the Chinese in these apartments were not already deprived of night light but were also exposed to the plague of mosquitoes that caused irritation and many skin diseases.[166]

Districts	Petroleum Lamps	Oil Lamps	Total
Intramuros	443	0	443
Binondo	280	249	529
Santa Cruz	58	266	324
San Miguel	119	4	123
Sampaloc	65	2	67
Quiapo	125	101	226
San José	23	11	34
Tondo	22	120	132
Parks and *Paseos*	344	59	403
Total Number of Street Lights	1479	812	2291

Table 8: Number of street lamps per suburb on the right bank of the Pasig river, 1882. (No data was provided for Paco, Ermita, and Malate.)
Source: NAP, AF-BTNT-CCHS-CSIC, Alumbrado.[167]

Table 8 shows that until 1882, lamps fueled by oil and petroleum were still the typical structures in Manila´s streets. Like in the earlier decades of the nineteenth century, Intramuros, and the suburbs of Binondo, Santa Cruz, and Quiapo had the most number of street lamps.

[166] Codorniu y Nieto, (1857), pp. 128-129.
[167] AF-BTNT-CCHS-CSIC, Alumbrado, Microfilm Roll 1776, Relación detallada de las calles y plazas en que están colocados los faroles del alumbrado público, 10 de marzo de 1882.

Binondo had even more light poles than Intramuros but all the lamps of the latter were already the better petroleum-fueled lanterns. This numerical data could be appreciated better when juxtaposed to the

Meanwhile, it is interesting to note that in the humble district of Tondo, the more economical yet dusky and risky oil-lamps were the ones giving light to its residents. A detailed list of the number of lamps per street per suburb in 1882 is provided in Appendix Chapter 4, D.

The economic state of the capital and the political priorities of the government did not help in the rapid materialization of the gaslight project. During the late 1860s to the 1870s, much of the city council´s energies were focused towards the construction of the capital´s first waterworks system project. The Ayuntamiento recognized that ¨among the great improvements that municipalities have registered in the modern times, gas lamp appears in the foreground [but] it is not hidden from us that the water supply must be undertaken first¨ (*entre las grandes mejoras que en los tiempos modernos registran las municipalidades, figura en primer término el alumbrado público de gas, no se nos oculta que antes deberá emprenderse la de traída de aguas*).[168]

Archival sources show that it was only on 22 July 1887 that the central government in the islands informed the Ayuntamiento of the approval of the establishment of gaslights in Manila and its arrabales. The service was to be provided by Don Rafael Costa representing a private company specializing in lighting and heating industries. Further digging in the archives is needed since the extant document did not provide additional details on the project except that aside from the usual authorities, the IGOP and the reformist members of the *Sociedad Económica de Amigos del País* were the vocal and aggressive sectors pushing for the approval of the lighting transition.[169]

[168] AHN, Ultramar, 5224, Exp. 2, Proponen cambiar alumbrado de aceite por el de gas en Manila, 1872.
[169] AHN, Ultramar ,5282, Exp. 15, Anteproyecto de sustitución del alumbrado de Manila, 22 de julio de 1887.

The advent of electric street lights

Five years after the first gaslight concession was granted, electric lamps were introduced in Manila in 1892. On 8 October of the said year, a twenty-year contract that granted the non-exclusive privilege of lighting the city was awarded by the Manila council to a public limited company (*Sociedad Anónima*) named *La Electricista*. The company was formed between a contract signed by the *Compañía General de Tabacos de Filipinas,* the *Sociedad Mercantil Millat, Marti y Mitjans* and Don José Moreno Lacalle.[170] According to the company´s by-laws, the big chunck of La Electricista´s capital came from two sources: first, from *Señores Millat, Marti y Mitjans* who put in 50, 000 pesos for the initial acquisition of materials and the expenses for the preparatory works of the project, and, second from the American company Thomson-Houston International Electric Company of Boston who added 100,000 pesos for electrical and mechanical materials for the central stations and electricity networks. In 1882, Thomson-Houston International Electric Company merged with Edison General Electric company that controlled the American electrical industry.[171]

When electric lamps were introduced in the Philippines, two models were used on the streets of Manila. The first and earlier model was the arc lights (*arco voltaico*) and the second one was the incandescent lamp. Arc lamps were cheaper than gas or oil lights but were viewed as difficult to maintain and clean, and their excessive heat could cause fires. Compared to arc lamps, incandescent lights were more economical and became the widely-used lighting system towards the late nineteenth century and the early decades of the next century. The bid specifications published by the Ayuntamiento[172] stated that *La Electrista* would put in place 1,000 incandescent lamps and 140 arc lamps[173]. The bid authorized the company the immediate establishment in the city of one or more central stations for the production of electricity for public lighting and private property. Apart from the lamps and the power stations, the company should also ensure that streets, and plazas, and paseos would be installed with electric conductors for the electric lights to function. Turning on and off the lamps and their

[170] *Estatutos de La Electricista Sociedad Anónima domiciliada en Manila* (Manila: Estab. Tipo-Litog. de Ramírez y Cía., 1892).
[171] Leonard S. Reich, ¨Lighting the Path to Profit: GE´s Control of the Electric Lamp Industry, 1892-1941,¨ *Business History Review* 66 (Summer 1992), p. 306 305-334
[172] ¨Pliego de Condiciones redactado por el Excmo. Ayuntamiento y aprobado por el Gobierno General de estas Islas para contratar el alumbrado público de la Ciudad de Manila por medio de la luz eléctrica,¨ *Gaceta de Manila,* 7 de febrero de 1895.
[173] The incandescent lamps had 20-spark plug each and the arc lamps with 2,000-spark plug each.

maintenance were also under its responsibility. All lanterns were to be turned on for 12 hours daily from 6:00 o´clock in the evening to 6:00 o´clock the following day. In times of disasters such as typhoons, earthquakes, and fires, the contractor could negotiate with the city council and provide alternative lighting through petroleum. The Ayuntamiento should pay 30 pesos for each incandescent lamp annually and 216 pesos for each arc street light annually. To regulate *La Electricista´s* service, the bid stated major and minor infractions that could mean the imposition of fines or the revocation of the contract. For instance, it could be revoked if the company would fail in lighting the streets for more than eight days.

On the eve of the end of Spanish rule in the Philippines, the *Boletín de Estadística de la Ciudad de Manila* published the table below (Table 9) reporting and summarizing the total number of lamp posts in the different districts of the city, the stretch of public streets, and the type of lamps existent in each suburb in 1896. Figure 3 is an attempt to represent this numeric data.

Electric street lamps					
	Arc lights (*arco voltaico*)	Incandescent lights	Petroleum/ Gas Lamps	Total	Length of public streets (in meters)
Intramuros	46	174	0	220	10, 708
Binondo	22	114	0	136	3, 806
Santa Cruz	12	165	0	177	14, 781
Tondo	4	79	9	92	11, 944
Quiapo	14	113	0	127	10, 534
San Miguel	12	60	0	72	8, 600
Sampaloc	6	45	2	53	4, 165
San Fernando de Dilao/Paco	0	6	154	160	10, 895
Ermita	13	67	150	230	5, 470
Malate	7	0	77	84	6, 915
San Nicolás	4	177	0	181	8, 392
Total	**140**	**1,000**	**392**	**1,532**	**96, 210**

Table 9: List of electric lamps and non-electric lamps in Intramuros and all the suburbs of Manila, 1896.
Source: Boletín de Estadística de la Ciudad de Manila, (December 1896)[174]

[174] ¨Relación del número de lámparas eléctricas y faroles de petróleo en cada distrito y extensión lineal de las vías públicas, Diciembre de 1896,¨ *Boletín de Estadística de la Ciudad de Manila*, (December 1896) as published in *El Archipiélago Filipino. Colección de datos geográficos, estadísticos, cronológicos, y científicos, relativos al mismo, entresacados de anteriores obras u obtenidos con la propia observación y estudio por algunos padres de la misión de la Compañía de Jesús en estas islas,* tomo I (Washington: Imprenta del Gobierno, 1900) pp. 370-371.

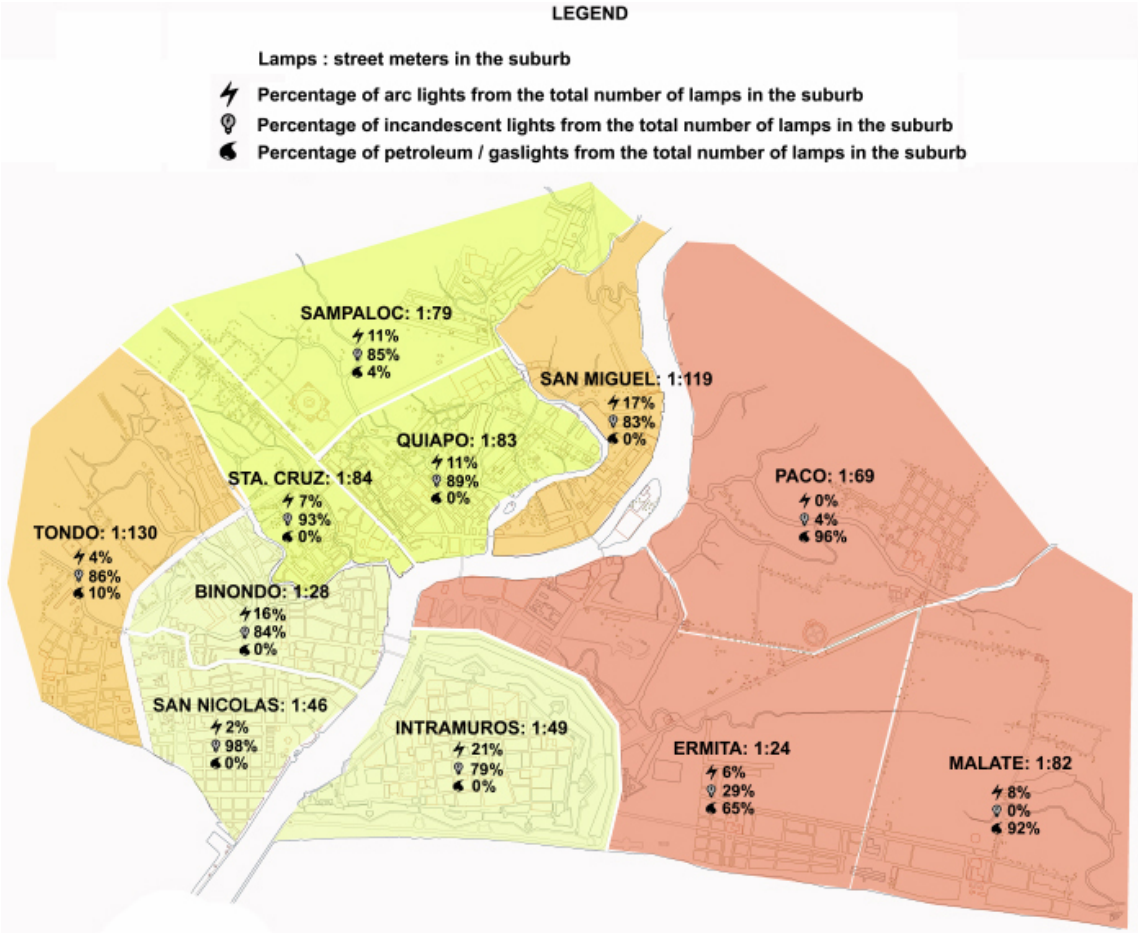

Figure 10: Existing electric lamps (arc lights and incandescent lights) and non-electric lamps (petroleum/kerosene lamps and gaslights) in Manila, 1896.
Source: Costelo 2020. Elaborated by using the data from the *Boletín de Estadística de la Ciudad de Manila,* 1896

Figure 10 is an attempt to represent better the numeric data provided by the authorities in 1896. From official data, we can infer from Table 9 and Figure 10 that a mix of electric lamps and petroleum/kerosene and gas lamps illuminated the entire urban sprawl by the last years of the century. Aside from Intramuros, most of the suburbs on the right side of the river bank (Binondo, Santa Cruz, Quiapo, and San Miguel) already abandoned the use of oil-lamps. Certainly, the colonial government prioritized the electrification of these districts for their economic importance. These were the domicile of the international merchant houses, tobacco factories, and food and beverage industries, commercial shops, and warehouses.[175] Meanwhile, Sampaloc and Tondo still had a few remaining non-electric street lanterns by 1896.

The figure also shows the ratio of lamp in relation to the length of public streets (in meters) in each suburb. For instance, in Binondo, there was supposed to have one lamp for

[175] Lagman and Martínez (Dec. 2014), pp. 68-71.

every 28 meters of thoroughfares while there was one lamp for every 119 street meters in San Miguel. However, a nuanced interpretation of this data is crucial. For example, at first glance, the suburb of Ermita was supposed to have good lighting compared to other suburbs since the ratio of lamp to the length of street is 1:24. Yet, this was not the case. One should pay attention to the type of lamps that were installed in each district. Ermita´s streets were still darker despite this data because in truth most of its night lights were still kerosene lamps.

Taking into consideration the number and type of lamps and the street segments, we can say that the best-illuminated districts were Intramuros and Binondo; followed by Santa Cruz, Quiapo, and Sampaloc; then San Miguel and Tondo. The poorly-lit areas were the less-commercial and predominantly residential districts of San Fernando de Dilao/Paco, Ermita, and Malate. In 1896, petroleum and gas lamps were still the prevalent forms of lighting in the arrabales to the left of the river bank. As discussed previously, these lamps produced dimmer lights, thus still keeping many corners and streets unilluminated. In short, the unequal access to new technologies and unequal development between the right and left side of the Pasig river bank was distinguishable in the public lighting service.

The advent of electricity did not immediately solve all the power and illumination shortage in the capital. *La Electricista* prided itself of having six large machines with 300 horsepower each, powered by eight Galloway boilers, which put into motion twelve dynamos capable of developing 2,080 voltages and 30 amperes each. This system would power the incandescent lamps and arc lights that the power company would install to provide public and private lighting in Manila and its outskirts. However, these technologies still proved to be insufficient as demonstrated by incidences of power outages in the last years of the century. *La Electricista* attributed this to the numerous new electric lighting installations which the machines could not fully support. During the eve of Spanish rule, it announced the impending arrival new 500-horsepower machines with dynamos capable of developing electric fluid not only for another 12,000 lamps but could provide electricity to the industrial and domestic needs of the city such as washing, ironing, sewing, printing, lithography, cigarette manufacturing, etc. Outside the capital, electricity was also beginning to be introduced. For instance, the Iloilo School of Arts and Crafts (*Escuela de Artes y Oficios de Iloilo*) tested electric lighting on 1 June 1895.[176]

[176] *Boletín de Estadística de la Ciudad de Manila,* 1896.

Indeed, gas and electricity changed Manila´s urbanscape in the the late nineteenth century as it opened, in the words of Raquel Reyes, the widespread use of ¨technological infrastructures of the ´good life´¨ and demonstrated a ¨myriad of desires and aspirations-prestige, status, cosmopolitanism, modernity, and urbanity.¨[177] For instance, electric-powered kitchen appliances and lamps, imported machineries for the sugar, rope, and rice industries were sold in the commercial shops of Binondo in the late 1880s. There were all unfolding at the same time that the first telecommunications service opened in 1885.[178] Further archival research is needed to verify when the directly metered electric lines were first installed the private homes of Manila´s residents. We only know that in 1904, public buildings were already equipped metered electric systems in Manila.[179] During the American rule, incandescent lamps would be the more typical street fixtures than the arc lamps.

During the turbulent years of the Revolution, the purpose of electrification was clear. The Americans who seized control of the city reported their first installations of lights in the city. From mid-1899 to mid-1900 incandescent lights were erected in almost each police station and military headquarters in the suburbs and in the Bilibid prison. Lighting was indispensable in securing order and control in the city. For instance, 14 incandescent lamps were installed in Santa Cruz police station in September 1899; 20 in San Miguel police station in the months of November 1899 and January 1900; 10 lamps in Quiapo police station on March 1990; and eight lamps in Binondo in April 1900. Meanwhile, four arc street lamps and 20 incandescent lights were installed throughout the Bilibid prison during the same period and five same lamps in the headquarters of the *Cuerpo de Bomberos*. By mid-1900, the colonial government then started putting alternating current lamps in the Divisoria and Arranque market and 20 series incandescent lamps in the Arroceros market.[180] It is worth mentioning that even with the end of Spanish rule in the Philippines, the concession for electric service continued, notwithstanding the change of colonial masters. *La Electricista,* maintained its franchise during the American occupation in the capital. It could be argued that the transition was made easier for the American as the foundations of technological advancement were already laid down during the last decades of Spanish presence in the archipelago.

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[177] Raquel A. G. Reyes, ¨Modernizing the Manileña¨: Technologies of conspicuous consumption for the well-to-do woman, circa 188s- 1930s,¨ *Modern Asian Studies,* 46, 1 (2012), p. 193.
[178] Ibid., pp. 199-200.
[179] *Annual Report of the Municipal Board of the City of Manila for the Year 1904* (Manila: Bureau of Public Printing, 1905), p. 144.
[180] ¨Report of Captain E.A. Millar, in charge of Department of Public Illumination,¨ *Annual Reports 1900* (United States: War Department, 1900), p. 297.

Responses and contestations

Street lighting, like other infrastructures, was a contested structure in the city´s urban organization. Accounts of Manila residents demonstrating their resistance and opposition to this municipal service were documented since the early introduction of public street lighting. While the illuminations brought a sense of awe and wonder and a sensation of vigilance and order, the public lighting tax became an additional burden for Manila´s residents. One of the earliest records was in 1829, when reports reached the district of Binondo and the Ayuntamiento that lamp posts were violently destroyed and demolished in the streets of Santo Cristo and Candelaria in Binondo. According to the initial report, not less than five streetlights were found to be destroyed-- the lanterns were removed, the steel pillars were broken, and only wooden posts were left standing. [181] For the colonial authorities to ascertain the extent of the damage and verify its instigators, the inventory of the existing street posts on 1 January 1824 by José María Rendón, steward of the Ayuntamiento´s assets, was used as a reference.[182] Upon further field inspection, the authorities realized that more than five lanterns were broken. Of the 71 glass lamps, 46 were found to be destroyed. Furthermore, three of the 61 tin candle holders were also damaged.

The city council on its first reports were sort of certain that the provocateurs of the act that damaged the capital´s properties were people who were satisfied with bringing more darkness to the night to give way to their lawlessness and crimes. In the words of the Ayuntamiento, ¨under the cover of darkness at night, the most horrific crimes were always committed, among them robberies, deaths, murders, and others that tend to alter the rest of families, public tranquility, and the order of peoples¨ (*al abrigo de obscuridad de la noche se cometieron siempre los crímenes más horrorosos entre ellos robos, muertes, asesinatos, y otros que tienden alterar el reposo de las familias, la pública tranquilidad, y el orden de los pueblos*).[183]

[181] AGI, Filipinas, 580, Testimonio del expediente instruido sobre los faroles, pescantes, y demás utensilios pertenecientes a alumbrado del Pueblo de Binondo, Año de 1829.
[182] AGI, Filipinas, 580, Inventario por José María Rendón, mayordomo de Propios del Excelentísimo Ayuntamiento Constitucional de esta capital, Manila, 1 de enero de 1824.
[183] AGI, Filipinas, 580, Testimonio del expediente instruido sobre los faroles, pescantes, y demás utensilios pertenecientes a alumbrado del Pueblo de Binondo, Año de 1829.

After conducting an investigation, the colonial government found out that the incident was instigated by Don Jose Felipe Arnedo. According to the report, Arnedo ordered the destruction, surely with the help of the natives, because they ¨could no longer endure the suffering of paying too much for the oil and other accessories¨ (*por no poder sufrir más el gasto de aceite y dependientes*) needed for public lighting.[184] Archival documents, however, lacked further details on how this case progressed. Yet, this account reflects how the urban residents showed their defiance and resistance to a structure that represented additional burden for them.

Meanwhile, in the second half of the century, the colonial government considered raising the street lighting and cleaning tax imposed by the capital from one and a half *real* to three *reales* for each *vara* of the façade of houses and buildings in the capital.[185] On 9 November 1863, Don Florencio Rodriguez filed a complaint and an appeal on the reduction of this tax on behalf of the several residents[186] of Manila. The residents traced the origin of the street tax and reminded the government in the islands that no less than the King of Spain dictated that one and half *real* tax for the colony. They complained that the measure aggravated the proprietors´ woes since in 1859, the laws included not only the measurement of the façade but also the sides, back, gardens, and the yards of houses. Naturally, this meant additional costs for the residents at a time of great difficulty. 1863 was the year of successive strong typhoons and the destructive 3 June earthquake. The misery of the city inhabitants was best described by Rodríguez below.

> Since the beginning of the year, successive calamities of different types have been afflicting these Islands, especially this city and its suburbs, constituting a conflict difficult to explain. [A]s distressing as it is, the agreement of the City Council on 21 July approved by the Superior [Government] has aggravated more and more this lamentable situation, for which it was resolved that the same double tax will be charged even for properties ruined by the previous earthquake in the 3rd of June. It is needless to say that due to such a disastrous catastrophe, many of the owners find themselves in the most deplorable indigence and are obliged to [pay] the property tax, losing the little that is left of them due to their misfortune. And if so, how can these hapless owners

[184] AHN, Ultramar, 5153, Exp. 4, Control de propios y arbitrios por Hacienda, No. 3 Testimonio promovido por el Excelentísimo Ayuntamiento de esta Capital sobre el alumbrado del pueblo de Binondo extramuros, 15 de junio de 1829.
[185] AHN, Ultramar, 5172, Exp.19, Sobre Aumento de impuesto a los edificios de la capital y Binondo para el aseo y alumbrado de los mismos, No.1, Aumento hasta tres reales el impuesto para el alumbrado y limpieza, 22 de marzo de 1858.
[186] These residents were identified as Don José Alaejos, Don Victorio de los Reyes, D. Vicente Avilés, D. Manuel Callejas, D. José de Vinciburo, D. Eduardo de Resurrección Hidalgo, D. José de Aguirre, Dª Segunda Salvador, Don Juan Reyes, D. José Iriaza, D. Miguel Wenceslao Soriano, D. Roque Monroy, D. José Florencio Rodríguez, D. Tomás Fuentes, Don José Gabriel Gonzales y Esquivel, Don Francisco Rogent, Don Doroteo Martín de Ángeles.

meet the burdensome payment which is double the amount of the said tax? This suffering is truly doubly grave. [187]

Desde el principio del año sucesivas calamidades de diferentes especies vienen afligiendo estas Islas especialmente esta Ciudad y sus arrabales, constituyéndolos en un conflicto difícil de explicar, y tan angustiosa como la lamentable situación ha agravado más y más el acuerdo del Excelentísimo Ayuntamiento de 21 de julio aprobado por esta Superioridad por el que se resolvió se cobrara el mismo impuesto de dupla cantidad aún por las fincas ruinosas a consecuencia del terremoto de 3 de junio anterior. Excusado es decir que por tan funesta catástrofe muchos de los propietarios se ven en el día en la más deplorable indigencia y obligados además al gravamen que tienen sobre sus fincas, de manera que tendrían que perder hasta lo poco que les había quedado en su infortunio. Y siendo así, ¿cómo esos desventurados propietarios podrán cumplir con el gravoso pago de dupla cantidad de dicho impuesto? Es en verdad doblemente grave su tribulación.

However, this outpouring of emotions of the city´s residents did not appeal to Baltazar Giraudier, a Spanish peninsular who was a member of the city council in the 1860s. According to him, the petition should not be considered by the administration because residents should be compelled to contribute for the development of the city´s collective life. Criticizing the lack of solidarity of the proprietors, Girauder remarked that owning properties and expecting security from the government but ¨not contributing under any circumstances to the support of the obligations of the State, rejects all the innovation¨ (*no contribuir bajo concepto alguno al sostén de las obligaciones del Estado, rechaza toda la innovación*). He added that residents could not enjoy calmly the progressive development without subsiding and the supporting the State.[188]

For almost half a century, the street tax did not change from 1817 to 1863. Here, Giraudier may be seen as somebpdy expressing a nineteenth-century idea of civic responsibility. However, its timing evoked insensitivity to the miseries and misfortunes of the people. In 1863, consecutive environmental catastrophes and an outbreak of cholera epidemic challenged the colony´s inhabitants. Despite the people´s supplication, the doubling of the street tax was approved and implemented.

Through time, the measuring and valuation of properties that would serve as basis for the propietor´s street tax was a heavily contested enterprise. The city government complained

[187] AHN, Ultramar, 5191, Exp. 14, Impuesto municipal a las casas de varios pueblos para el alumbrado y barrido o limpieza de las calles, No. 13, Copia del expediente promovido por Don Florencio Rodríguez a nombre de varios vecinos sobre rebaja de la contribución del alumbrado, 9 de noviembre de 1863.
[188] AHN, Ultramar, 5191, Exp. 14, Impuesto municipal a las casas de varios pueblos para el alumbrado y barrido o limpieza de las calles, No. 14, Carta de Baltazar Giraudier, de noviembre de 1863.

of the many residents who suddenly ¨disappeared¨ from their domicile as a means of escaping the municipal obligation. For instance, the gobernadorcillo of Binondo reported on 12 September 1891 that despite the repeated inspections and visits of the *cuadrilleros* for the proper appraisal of a house property in Madrid Street, a certain Doña María Natalio could not be located in the referred house and street. As a consequence, the local authorities could not proceed to the collection of tax for the said resident.[189]

To ensure the ideal state of the street lamps and their accessories, guards (*celadores*) were hired by the authorities to aid the urban police (*Guardia Civil Veterana*) in the vigilance of the city lights. Broken and stolen night lamps were commonly reported in the late nineteenth century. This was the case when the *celador* Angel González reported a case of burglary on 25 October 1895. According to the guard, he caught an *indio* that was secretly carrying a street lamp while patrolling on the streets of Parían near the Paseo de Magallanes. When González interrogated the man, the latter suddenly dropped the lamp and tried to escape. The *Guardia Civil Veterana* who were also in the area chased the unidentified man who jumped off the Puente de España to the Pasig river. The lamp was returned the next day to the *La Electricista.*[190]

The increasing consciousness and demands of Manila´s residents on how the city, and the colony in general, was being governed was reflected in the periodicals in the late nineteenth century. The newspaper *Manila Alegre* exposed through satire the problems that hounded the public lighting infrastructure in Manila. Criticizing the instability and poor service yet costly public lights, it published the following on On 8 October 1885:[191]

SONGS	CANTARES
Mr. Mayor	Señor alcalde mayor
Don´t turn off the lamps	No apague useted los faroles
Because they turn off on their own	Porque ellos se apagan solos
At nine o´clock at night	A las nueve de la noche.
The box of kerosene is priced at	La caja de petróleo se cotiza
Three pesos and seventy five cents.	a tres pesos y setenta y cinco céntimos.
I thought that it was more expensive.	Yo creí que era más caro el petróleo.
Judging by the price of the street lighting!	¡A juzgar por el alumbrado público!

[189] AF-BTNT-CCHS-CSIC, Alumbrado, Microfilm Roll, 1775, Informe de Ramón Aguilar, gobernadorcillo de naturales de Binondo, 12 de septiembre de 1891.
[190] AF-BTNT-CCHS-CSIC, Alumbrado, Microfilm Roll, 1775, Incidente referente al robo de un farol del alumbrado público ocurrido en el puerto Parián de este distrito, 25 de octubre de 1895.
[191] ¨Cantares,¨ *Manila Alegre* no. 1*,* 8 de octubre de 1885.

On 11 December 1885, it chided the distorted contentment of the Ayuntamiento of placing a half dozen ¨dying lanterns¨ (*moribundos faroles*) in Calle Real.[192] It also condemned the city´s abandonment on some neighborhoods who were left unlighted despite that the fact that these were the most dangerous places at night, and where the gravel piles are highest and the potholes deepest.[193] *Manila Alegre* published numerous critiques on the slow action and misplaced priorities of the authorities on the shift from the traditional lighting systems of oil and kerosene to gas and electricity. As a response, it called on the officials to acquire a more progressive and modern viewpoint and prioritize the betterment of the illumination of the capital´s streets.[194]

Street lighting illuminated Manila´s corners to modernity. Public lighting and the advent of gas and electric-powered technologies, along with other electric-powered technologies of the telegraph, changed the cultural and urban landscape of Manila. However, like in all other colonial infrastructures, the impositions and unequal access to this technology sparked dissent and different forms of contestation and negotiations within the colonial society.

[192] It did not specify in which district or suburb.
[193] *Manila Alegre* no. 2*,* 11 de diciembre de 1885.
[194] ¨Arañazos,¨ *Manila Alegre* no. 4, 24 de enero de 1886. ; ¨Chismografía,¨ *Manila Alegre* no. 8, 24 de febrero de 1886; ¨¡Música!,¨ *Manila Alegre* no. 9, 2 de marzo de 1886; ¨En las sombras,¨ *Manila Alegre* no. 14, 8 de abril de 1886, ¨Cantares,¨ *Manila Alegre* no. 16, 24 de abril de 1886; ¨Pot-Pourri,¨ *Manila Alegre* no. 17, 1 de mayo de 1886; ¨Manililla,¨ *Manila Alegre* no. 32, 24 de agosto de 1886; ¨¡El Gas!,¨ *Manila Alegre* no. 35, 16 de septiembre de 1886; ¨Pot-Pourri,¨ *Manila Alegre* no. 44, 24 de noviembre de 1886.

Chapter Concluding Notes

In this chapter, we followed how the streets were paved, named and numbered, aligned and widened, cleaned and cleared, and then lighted and embellished. All these followed the story of the increasing legibility of Manila´s urban space. The concentration of functions in the street made it an exciting colonial space in the late eighteenth to the nineteenth century. Rapid urbanization and the arrival of ideas of modernity were most significantly observed in the public works project on the street and public spaces. The colonialist´s idea of creating a rational, orderly, and progressive city was demonstrated in its attempts to construct, reform, and design the physical characteristic of the street as one crucial part of the colonial built environment.

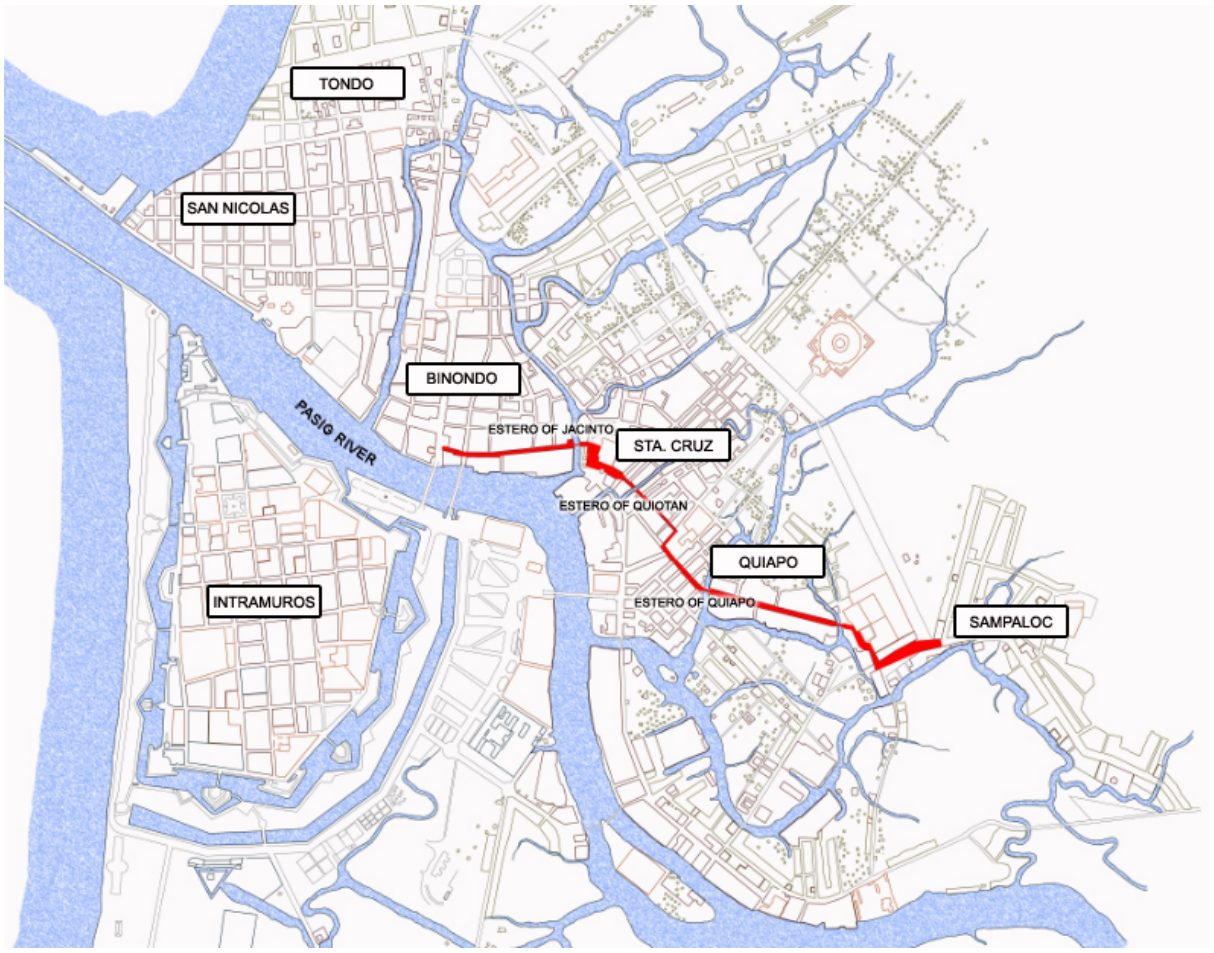


Figure 11: Map of Manila demonstrating the colonizer´s idea of the principal street that would connect the major suburbs in the right bank of the Pasig river
Source: Costelo, 2020 elaborated from the different maps and plans in AHN.

The figure above shows the Binondo-Sampaloc street network that was envisioned by Manila´s urban reformers in the nineteenth century. Linking the arrabals that were divided by a multitude of esteros was one challenge that the city planners and colonial administrators had to resolve especially in the face of economic and demographic developments of the time. Connecting the capital necessitated wider and better-organized streets and improved layout of settlements and houses. If one would examine the figure above, indeed the better-configured arterial streets and bridges from Escolta Street, to Carriedo Street, San Sebastian Street, and Real Street of Sampaloc showed that, by this time, this served as the conduit of the growing arrabals of Binondo, Santa Cruz, Quiapo, and Sampaloc. However, was this already enough for a ¨network of arterial roads¨? Was street construction, street widening and street aligning sufficient? Throughout the century, flooding especially during the monsoon season was a typical challenge for Manila´s inhabitants. After these floods, a street repair would always be imperative. However, this study showed that no less than the Manila city government itself revealed the underfunded public street projects. In terms of street lighting, Spanish authorities introduced light to the public spaces to solve the issues of security and order, and eventually to improve the city´s ornate and propel the emerging industries in the capital. Through this municipal endeavor, new trends and technologies were initiated and implemented towards the late nineteenth century. Eventually, this will serve as foundation for the electrification project during the American rule. However, Manila´s lighting experience portrayed the unequal access to this modernizing infrastructural system.

Through the street, the colonial officials applied rules and regulations towards achieving an image of a city as one which is characterized by progress and civilization. Consequently, the growing regulation related to street use and circulation transformed it to be one of the most contentious colonial space. Manila, like most colonial cities, was a space for the interaction of different socio-economic, racial, and physical categories. This chapter attempted to locate and demonstrate the *mestizos,* the native *indios,* and the Chinese in the everyday politics of street configuration, street regulation and control. In this study, we saw how the street as part of the built environment ¨framed the everyday life¨[195] of a heterogeneous colonial urban Manila. This diverse character of the city highlighted its multi-dimensionality as varied images of contestation and negotiation took place as colonial policies were implemented. Arguably, the street was a site for quotidian conflicts, resistance, and dialogue in the context of colonial rule.

[195] Dovey, 1999, p. 16.

For instance, issues of appropriate zoning, suitable behavior, movement and displacement characterized the public works projects and policies related to the street.

However, repeated instructions, regulations, and decrees that lasted for almost a century and a half long do not paint an image of efficiency and efficacy. As Alzate Echeverri pointed out in the case of Nueva Granada, ¨repetitions of the law could be considered as a sign of its ineffectiveness, and perhaps a testimony of a mentality of the society¨[196]. The daily compliance and defiance of the residents could reflect the power and impotence of the colonial ruler as well as the dominant habits and attitude of the ruled. It is in the arena of the street where the most ordinary, routinary, and mundane colonial rules and policies were challenged and put to the test. Undeniably, the nature of the street as a public space and how it should be designed and utilized continued to be contested in the daily arena for almost the entire Spanish colonial rule. Indeed, this study affirms the view of streets as ¨sites and signs of discipline and disorder as well as symptoms and symbols of modern urbanism¨.[197]

Almost two centuries had passed, but it seemed that the Spanish administrator´s preoccupation on public sanitation, hygiene, and order on streets and public spaces were still the same in the early years of American colonial rule in the islands. In the early years of American rule in the Philippines, the Municipal Board passed ordinances for the effective management of the colonial capital. Many of the first ordinances had to do with the upkeep of streets and public places (Ordinance No. 7 ¨The collection and disposal off garbage and rubbish enacted on 24 December 1901¨), Ordinance No. 9 ¨Authorizing the Board of Health to install the so-called ´pail conservancy system´ at the expense of the property owner enacted on 26 December 1901¨, Ordinance No. 13 ¨Relating to the Use of the Public Streets and places of Manila enacted on 28 December 1901¨, Ordinance No. 22 ¨Prohibiting the practice of cleaning ears, scraping eyelids, or barbering on the streets, lanes, alleys, and public squares enacted on 5 March 1902¨, Ordinance No. 28 ¨Relating to breaches of the peace and disorderly conduct, intoxication, obstructing and misusing public streets and places, and other acts that are injurious to persons and property enacted on 19 March 1902¨.[198] Indeed, ¨insalubrious streets filled with garbage, excrement, and other offensive waste, disorderly circulation of animals, peoples, and

[196] Alzate Echeverri (2006), p. 96.
[197] Fyfe (1998), p.4.
[198] Report of the City of Manila for the Period From 7 August 1901 to 30 June 1902. Annual Report 1903. Manila Municipal Board

carriages in thoroughfares, unregulated economic activities on public spaces and streets by unlicensed vendors, and the excessive conglomeration of idle individuals and vagrancy on public spaces"[199] were recurring concerns that both the Spanish and the American colonial governments had to contend with.

[199] Lico and De Viana (2016), p. 129.

Chapter 5.

El abastecimiento del agua: The Waterworks Project and Manila´s Water Distribution and Access

¨[T]he natives collected and drank water from Santolan with thirst and they gathered around the first water fountain with admiration.¨

los naturales recogían y bebían con ansia el agua de Santolan y se estacionaban con admiración en torno de la primera fuente.[1]

On the 20th to the 24th of July 1882, Manila and its residents were portrayed in a festive and jovial mood. The streets and the façades of houses and public buildings were decorated with banners. The entire city was lighted and decorated with arcs, banners, and other artistic adornments. Carpets and awnings were erected along Escolta Street. A big banner with the words ¨*A Carriedo el arrabal de Santa Cruz*¨ and poles marked with ¨Genaro Palacios- Vara-Jové¨ were displayed at the Visita Bridge (*Puente de Visita*) which connected Binondo to Santa Cruz. The centric Plaza de Goiti was also adorned with arcs and works of art by Alberoni which depicted allegories to the inauguration of the waterworks system. In Quiapo, where a street and bridge were named after Carriedo, exaltation for the philanthropist came in the decoration of houses' doors, banners, and arcs. The Carriedo bridge had flower coronations while the long stretch from San Sebastian to Sampaloc was adorned with masts and colored lanterns.[2]

There were sports activities in the different parts of Manila and its suburbs. At night, the streets were illuminated until 10:00 in the evening. The plazas were filled with night performances of almost all important civic and military bands. Fireworks in Bagumbayan became the most-awaited part of the night. The 23rd day was the highlight of the week. This was the formal inauguration of the first waterworks system of Manila, a day that was chosen to also celebrate the birthday of the Queen Regent María Cristina. A civic procession was held which was participated by the different sectors of the city, from the high civil and religious officials, members of the Manila city council, members of the foreign consulates in the islands, members of the *Sociedad Económica de Amigos del País* and the press, professors and students of the different schools and colleges, and urban residents of all classes. Artistic floats depicting

[1] Francisco Mas y Otzet, *Carriedo y sus obras: memoria de las obras pías de los pobres y de las aguas instituidas por Don Francisco Carriedo y Peredo y crónica de los festejos que el Ayuntamiento de la Ciudad de Manila ha celebrado para conmemorar la inauguración de la primera fuente de aguas potables* (Manila, Establecimiento Tipográfico de Ramírez y Giraudier, 1882), p. 63.
[2] Ibid., pp. 108-109.

the different symbols of water paraded the streets. An order was released stating that all babies who will be born on the 23rd will be given 25 pesos. True enough, almost all of the babies registered in the capital on that day were named Cristina or Cristino, in honor of the Queen Regent. Even the couples who got married on the 23rd were also given a cash prize![3]

All these activities formed part of a week-long celebration of the inauguration of the symbolic fountain of the potable water system in Manila named after the projects´ principal benefactor Francisco Carriedo. These celebrations and the festive reception of the people became a symbolism of a new age in the capital. In the words of Manila´s colonial officials, the act brought ¨an opening of the capital of the archipelago to a new era of prosperity and fortune¨ (*abriendo a la capital del archipiélago una era nueva de prosperidad y de ventura*). [4]

It was a new age for a more modern city equipped with a hydraulic infrastructure that would supply potable water to its residents. The water system and the fountain that was inaugurated was not only a mere source of water, it was and was used as a symbol of a modernizing and urbanizing capital. And while the first fountain was being inaugurated, the colony´s first railway system was already on the pipeline. Bridges were being constructed and reconstructed. Streets were not only straightened and widened, they were also illuminated at night. Tranvías became typical sightings on the streets. A few years later, estuaries were cleaned up, the city´s port was dug up and constructed with floating dikes. This was how the colony, although for the most part Manila, was reported or portrayed in colonial official sources, a colony that was on its path to modernization.

In the Philippines, the Manila potable water works project was one of the most significant colonial sanitary infrastructure projects in terms of magnitude, budget, and period of completion. Primarily considered a nineteenth-century feat, this infrastructure which was formally inaugurated in 1882 is regarded as one if not the most important sanitary infrastructure achievements of the Spanish colonial government. A centerpiece public works project of the city council of Manila at the helm of the techno-scientific expertise of the engineers of the IGOP, the hydraulic system intended to provide solutions to the problems of health and sanitation in a rapidly urbanizing Manila, a capital that was perennially plagued by cholera epidemics throughout the nineteenth century and a city that was in dire need of adequate, clean, and safe water.

Used as a testament of modern engineering in the colony, the infrastructure was central in cleansing, domesticating, and transforming the urban body of the city. Matthew Gandy

[3] Ibid.
[4] Mas y Otzet, p. 65.

argued that the intersections between water and the technological spaces of modernity, has evolved to cover a wide range of events and processes such as the change of attitudes towards the body, the policy of water supply and sanitation, and the symbolic meaning of water for modern cities.[5] In the nineteenth century, organicist views of the city became a characteristic feature of the time. The city as a living body composed of organs, tissues, fluids, vessels, arteries, and complex systems was a recurring analogy in many accounts, especially among hygienists, urban planners, and policymakers.[6]

This chapter builds on the pioneering study on the nineteenth-century Manila waters by Xavier Huetz de Lemps.[7] His established that waters in the Pasig river and the tributary esteros were already environmental and public threats to the capital as early as the nineteenth century. This chapter expands the said study by tackling the techno-scientific innovations that characterized the Manila waterworks project to sanitize and domesticate the murky, dirty, sickly and unruly body of the modern city. This chapter traces the century-long inception and materialization of the Manila waterworks system demonstrating the administrative, economic, and techno-scientific changes and processes that this groundbreaking public works project entailed. Numerous studies, intents, and political will had to be mustered before water could be identified, located, pumped, stored, and distributed to the colonial capital. It also interrogates how water was used both as a tool and symbol to cleanse and modernize the colonial body and colonial city. It discusses how water access, exclusion, and control led to an ideological and spatial transformation of Manila in the last decades of the nineteenth century. Despite the documents´ fragmentary and poor state, the NAP offers an incomparable and rich account of the local realities, changes, and experiences when the waterworks system was put in place.

A. The ¨Bacteriological¨ and ¨Networked¨ City: Ideas on Water Provisioning and Hydraulic Infrastructures

During the eighteenth century and the first half of the nineteenth century, the dominant miasmatic view regarded environmental factors such as contaminated and stagnant water, polluted air, and agglomeration as principal causes of infections and diseases. In Manila, the

[5] Matthew Gandy, *The Fabric of Space. Water, modernity, and the Urban Imagination* (Cambridge, Massachusetts: The MIT Press, 2014,) p. xvii.
[6] Erik Swyngedouw, *Social Power and the Urbanization of Water* (New York, Oxford University Press, 2004), pp. 31-35. The British architect Sir Edwin Chadwick and French urban planner Baron von Hausmann widely used the metaphor of circulating waters to instill urban reforms in the mid-nineteenth up to the latter part of the nineteenth century.
[7] Huetz de Lemps (2007b).

putrefying conditions of its principal waters in Pasig river and the esteros became increasing health hazards for the city residents. No less than the sanitary professionals in the archipelago recognized these threats as reflected in the writings of medical doctor Antonio Codorniu y Nieto in the 1850s as shown in Chapter 1. The capital´s susceptibility to these problems of insalubrity and public health was always tested as waves of infectious and water-borne diseases exposed the people´s safety and well-being.[8] The hygienist movement (*higienismo*) emerged in the midst of these alarming problems that were regarded as effects of the undeniable trail towards urbanization and industrialization. As the nineteenth century progressed, the hygienist movement which articulated the necessity of improving the sanitary conditions of the cities became strong not only in the European metropolises but also in the colonies. Eventually ¨the hygienist ideals were picked up by urban projects¨ and eventually diseases were more than a problem of individual concern but rather a bigger and societal one that needed structural and institutional responses.[9]

The movement was further propelled by the socio-technological developments and new discoveries in science and bacteriology by the mid and late nineteenth century. The scholar Matthew Gandy argued that the period gave rise to the conceptions of a "bacteriological city"- a city "defined by new features and modes of social discipline based upon ideologies of cleanliness".[10] Gandy cited a confluence of many factors that led to the emergence of the ¨bacteriological city¨ such as the ¨advances in the science of epidemiology and later microbiology which gradually dispelled miasmic conceptions of disease; the emergence of new forms of technical and managerial expertise in urban governance; and the innovative use of financial instruments to enable the completion of ambitious engineering projects.¨[11]

The realization of these massive infrastructures necessitated wide-ranging advancement in the exemplars in construction, technology, and engineering. Scholars theorized that the nineteenth century, especially the second half, witnessed these paradigm shifts as new types of urban models emerged. This urban design was coined by historians as ¨networked city¨[12] wherein cities were characterized by meshes of large-scale integrated and centralized networks. Urban historians Stephen Graham and Simon Marvin theorized that this period was the first phase of the networked cities when different centers across the globe started to ¨consolidate,

[8] Huetz de Lemps (1990).; De Bevoise, (1995).
[9] Ibarra (2016), p. 184.
[10] Matthew Gandy, "Rethinking urban metabolism: water, space and the modern city," *City: analysis of urban trends, culture, theory, policy, action,* vol.8, no. 3 (December 2004), p. 365.
[11] Ibid.
[12] Stephen Graham and Simon Marvin, *Splintering Urbanism. Networked Infrastructures, Technological Mobilities, and Urban Condition* (London and New York: Routledge, 2000), p. 56.

standardize, and regulate networks of infrastructures and utilities that serviced the urban communities¨.[13] Meanwhile, Leslie Tomory posited that ¨networks are materially integrated infrastructure, with a particular focus on the built urban environment¨[14] These networked public works were best represented by the different systems that were put up in cities such as transportation and communication, lighting and electricity, and water and sewerage. In Europe, the most celebrated model was Georges-Eugène Haussmann´s Paris with its modern infrastructure networks of roads, canals, water, and sewerage scheme.[15]

These conceptions eventually directed cities to begin investing in urban sanitary infrastructures. In the case of Manila, modern hydraulic engineering was introduced to address the water insufficiency, contamination, and sewage problems of the city. Juan Manuel Matés Barco´s numerous works on the development of water supply in Spain highlighted the nineteenth century as a period of administrative, ideological, and techno-scientific transformations that led to the laying out of a modern water supply system in the Peninsula´s main urban centers.[16] In Spain, the period witnessed a bigger role played by the municipal governments in undertaking urban projects such as water supply, public sanitation, and other services for the resident´s welfare. This translated to the passage of several laws compelling the municipal authorities to provide water service and granting them economic and administrative authority to manage and regulate water access, distribution, and concessions.[17]

In the late eighteenth century up to the nineteenth century, urban policies and infrastructures were put in place as hygienic and sanitary reformers as well as engineers and technological experts played a crucial role in the change of attitude towards public health and sanitation. The *Canal de Isabel II* waterworks project in Madrid which was initiated in 1851 and inaugurated in 1858 is considered as a display of the notable Spanish advances in the field of science and engineering. Considered a modern accomplishment, the water infrastructure involved the construction of aqueducts, canals, and tunnels that channeled water from the Lozoya river to the Spanish metropolis' growing population. The *Canal de Isabel II* project would turn out to be one of the primary references and models of Spanish engineers in Manila in their planning and implementation of the colonial city´s first hydraulic infrastructure. This period also coincided with the establishment of the Civil Engineering Corps (*Cuerpo de Ingenieros*

[13] Ibid., p. 40.
[14] Leslie Tomory, ¨London´s Water Supply before 1800 and the Roots of the Networked City,¨ *Technology and Culture,* volume 56, number 3 (July 2015), p. 705.
[15] Ibid.
[16] Matés Barco (2001), pp. 147-150.
[17] Ibid (Julho-Dezembro de 2017), p. 45-46. Some of the laws passed include the *Ley Municipal de 1877, Ley de Obras Públicas de 1877,* and the *Ley de Aguas de 1879.*

Civiles).[18] This institution later produced a new generation of engineers and specialists that served Spain and its remaining colonies. As discussed in Chapter 1, the new breed of civil engineers behind the finalization of the Manila waterworks were products of this specialized technical corps.

The conception and construction of hydraulic infrastructures in the two other remaining colonies of Spain were contemporaneous to the Manila waterworks project. In La Habana, Cuba, a massive project of conducting water through an aqueduct system was started in 1858. However, its construction was extremely slow resulting in its late inauguration in 1893. A few years later, Spanish rule in the Caribbean island would come to an end.[19] Meanwhile, a project utilizing hydraulic water pump was conceived in San Juan, Puerto Rico almost the same time as the construction of the *Canal de Isabel II* in Madrid. Manila, the Spanish colonial capital was one of the first cities in the Southeast Asian region to establish a piped waterworks system, next to Singapore´s formal opening of its first waterworks in 1878.[20] Manila´s system became operational in 1882. Throughout the nineteenth century, Batavia (modern-day Jakarta), the Dutch colonial capital´s main source of water was artesian wells and it was only in the 1920s that piped water was introduced to the city.[21] This was also the case of French-ruled Saigon (modern-day Ho Chi Minh) when an old well system was constructed in the capital in 1879. This supplied the capital with water while massive canal-dredging projects characterized the French agricultural-hydraulic ventures until the turn of the century.[22]

Colonial reports revealed that the government utilized the waterworks project as an attempt to introduce modernity and demonstrate its reform agenda in the colony in the last decades of Spanish rule in the Philippines. Part of this reform agenda was the creation in 1866 of the *Inspección General de Obras Públicas* (hereafter, IGOP) which took the responsibility of planning, carrying out, and supervising the construction of public works including the waterworks system.[23] While it is true that the project of supplying Manila with clean piped water was first envisioned since the second half of the 18th century, the arrival of a new breed of civil engineers due to the creation of the IGOP was a pivotal factor that finally transformed

[18] Faustino Merchán Gabaldon, ¨El Canal Isabel II y la contribución de los ingenieros a la modernidad en España,¨ *Revista de Obras Públicas,* no. 3 (enero 2004), pp. 55-62.
[19] Rolando García Blanco, ¨Una obra maestra en La Habana: el Acueducto de Albear,¨ *Transportes, Servicios y Telecomunicaciones*, no. 26 (marzo 2014,) pp. 282, 295.
[20] Yeoh (2003), p. 176.
[21] Michelle Kooy and Karen Bakker, ¨(Post)Colonial Pipes: Urban Water Supply in Colonial and Contemporary Jakarta¨ in Freek Colombijn and Joost Coté, *Cars, Conduits, and Kampongs. The Modernization of the Indonesian City, 1920-1960* (Leiden and Boston, Brill, 2015), pp. 66-67.
[22] David Biggs, ¨Problematic Progress: Reading Environmental and Social Change in Mekong Delta,¨ *Journal of Southeast Asian Studies,* vol. 34, issue 1 (February 2003), pp. 89-90.
[23] Ros Costelo (2016).

this vision into a reality. With the establishment of the IGOP, engineers presented themselves as colonial reformers, and their study and implementation of public works projects in the Philippines became increasingly institutionalized, centralized, and standardized.

B. Manila´s Water and the Early Attempts of Carriedo, Cortes, and De la Corte

Rivers, esteros, streams and natural springs were the early water supply of colonial Manila and its nearby settlements and towns. By the nineteenth century, the growing thirst for fresh water was increasingly felt in the city. The capital´s population ballooned as a direct effect of the city´s rapid urbanization. Official and non-official correspondences, memoirs, and even literary works painted a very alarming situation of the quality of water supply in Manila beginning in the early decades of the nineteenth century up to the distressing degradation and contamination of the city´s waters towards the last decades of the era. Huetz de Lemps´ important study portrayed a social-environmental history of water in colonial Manila which located the Pasig River and its estuaries as principal water sources of the capital. He traced the complex and multi-layered factors that led to the city´s water pollution such as Manila´s very low topography and inadequate drainage, inefficient and insufficient waterways infrastructures undertaken by the colonial government, and the residents´ unhygienic urban practices.[24] This problem got worse when waves of cholera epidemics wreaked havoc not only in Manila but in the provinces during the nineteenth century.[25]

Francisco Carriedo and appropriating funds for the project

The idea of constructing pipelines to distribute potable water to the residents in Manila was first conceived in 1748 when General Francisco Carriedo y Peredo placed under the administration of the Ayuntamiento de Manila the amount of 10,000 escudos as initial capital to fund the project. According to Carriedo´s will, the initial amount should be invested so that it would reach the amount of 30,000 which at that time was the supposed budget to carry out the project of supplying clean and potable water to the colonial capital. Carriedo´s will identified the need to conduct studies on how to carry out the project. In terms of the type of building materials and technology, the Carriedo proposal was very much limited to its time. For

[24] Huetz de Lemps, (2001), pp. 497-504.
[25] Ibid., p. 489. Huetz de Lemps documented the years 1820-1823, 1842-1844, 1854, 1865, 1863-1865, 1882-1883, 1888-1889 when the epidemic hit the colonial capital.

example, water was designed to be carried by pipes made of tile or Chinese clay along a canal made of brick. The brick channel was intended to protect the pipes from earthquakes. Open reservoirs were proposed to be built so that in terms of water purification, water will be purified through sun exposure to remove its impurities. [26]

However, events such as the British occupation of Manila disrupted this project. It was reported that the amount even decreased to as low 9,501 pesos after the invasion of the capital.[27] It practically took a century before the interest of building water pipes in Manila was resuscitated when in 1842 and 1855, after a series of cholera epidemics, military engineers Tomás Cortes and Felipe de la Corte were appointed to undertake studies on supplying safe and clean water to Manila and its arrabales.

The Carriedo funds was left under the Manila city council´s administration for the decades and century that passed. According to Mas y Otzet, the city council´s role in the propagation of the Carriedo funds was indispensable. The funds were invested in different profitable ventures through time. When investment in shipping became risky, the city council was reported to have had transferred a big part of the funds to modest yet very safe investments. In 1859, city councilor Baltazar Giraudier pushed for the insurance of the Carriedo funds through diversification. A decade after, during the administration of Gov. Gen. José de la Gandara, Giraudier again formed part of the city council and made suggestions on how to ensure that the state of the funds was protected. As a result, proposals were made by city councilors José Joaquín de Inchausti and Esteban Balbas to reintegrate the funds and consign the amount to the *Caja de Depósitos.*[28]

This prudent investment from the side of the city council produced favourable results as it resulted the following state of the funds on 23 July 1867:

Investment	Amount
Shares in the *Banco Español Filipino de Isabel II*	12, 600
In the *Caja de Depósitos* with payment interests	21, 900
In the possession of several entities with property mortgages in the capital	143, 353. 44
Total existing capital	**177, 853. 44**

Table 1: State of Carriedo funds´ investments by 1867
Source: Mas y Otzet[29]

[26] Alexander W.E. Salt, "Francisco de Carreido y Peredo," *The Philippine Journal of Science,* vol. VIII, no. 3, (June 1913), p. 172.
[27] Genaro Palacios, "Proyecto de abastecimiento de agua de la ciudad de Manila", *Revista de Obras Públicas,* tomo I, 13, (1878), p.152.
[28] Mas y Otzet (1882), p. 58
[29] Ibid. p. 59.

Mas y Otzet argued that the increasing growth of the Carriedo funds was one of the key factors towards the revitalization of the potable water supply project for Manila. With this capital, and the technical studies made by the engineers and architects in the capital such as Brigadier sub-inspector of the *Cuerpo de Ingenieros* Felipe de la Corte, engineer Eduardo Ruiz del Arco, and Luciano Oliver who served as municipal architect of Manila for many long years, the project was propelled in the second half of the nineteenth century.

The efforts of military engineers Tomás Cortes and Felipe de la Corte

It practically took an era before the interest of building water pipes in Manila was revived when in 1842 and 1855, after a series of cholera epidemics, military engineers Tomás Cortes and Felipe de la Corte were appointed to conduct studies on supplying safe and clean water to Manila and its suburbs.[30] Studies such as those initiated by Cortes and De la Corte that explored, identified, and examined the water sources in Manila and its environs led to the production of new knowledge about the colony. These studies located and mapped the complex network of water systems in and nearby the colonial capital, its sources and flow, and the demographic composition of the urban capital in the mid-nineteenth century.

After surveying and inspecting the different bodies of water, Cortes in 1842 identified the rivers of San Mateo (northeast of Manila) and the stream of Tungtong which was part of the Marikina river as two possible sources of drinking water due to their excellent quality. Perhaps one important contribution of Cortes in the production of knowledge concerning the waterworks project was the population data that his studies were able to generate. Establishing the population data of each arrabal that would be serviced with water was one of the most crucial preliminary steps as this would set the required volume of water that would have to be distributed for the city. The following demographic information was reported by Cortes:

Suburb/Pueblo	Number of Inhabitants
Intramuros (Plaza de Manila) Composed of: Europeans- 3, 788 Natives- 2, 500 Military ersonnel in garrisons- 7, 000	13,288
Tondo	37,588
Binondo	57,048

[30] AHN, Ultramar, 491, Exp. 1, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Extracto del expediente, 1859-1886.

Sta Cruz	19,768
Quiapo	9,960
Sampaloc	11,456
San Miguel	4,432
San Fernando de Dilao/Paco	11,212
Ermita	17,680
Malate	19,292
Chinese and temporary residents	16,000
Total	**217,724**

Table 2: Number of inhabitants of Manila (Intramuros) and its suburbs as reported by military engineer Tomás Cortes
Source: AHN, Ultramar, 491, Exp.1[31]

Given this data, Cortes recommended that the city should be supplied with 5,030,632 pints (*cuartillos*) of water provided that each inhabitant of the city could consume 23 pints per day. This was equivalent to more than 10 liters per individual per day. This volume was equal to 120, 000 cubic feet of total daily consumption for Manila´s urban residents.[32]

Thirteen years later, another study was conducted in 1855 by De la Corte. Similar to Cortes, De la Corte began by furnishing the authorities with a formal report of the Manila´s water supply condition at that time. The military engineer echoed Cortes´ observation that the government should urgently recognize the impeccable need to establish a new system that would replace the existing dependence of Manila on the waters coming from the Pasig river and the esteros around the city- citing that it was not only hazardous to the city´s health but was also very insufficient to the increasing demands of the growing capital. De la Corte said that Manila was one of the important populations that lacked drinking water supply vis-à-vis its population´s daily consumption. Being the primary mercantile center of the colony, its ability to provide water to its population has greatly diminished while the number of its inhabitants has grown significantly. The engineer reported his technical observation that for most of the year, salt water coming from the bay would mix with the fresh water in the Pasig river and the esteros causing their insalubrity and unsuitability for drinking purposes. The engineer added that the water in the river was practically undrinkable even up to two miles upstream as reports that varied decomposing matter and putrefaction accumulated in these different bodies of water.[33]

[31] AHN, Ultramar, 491, Exp. 1, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Extracto del expediente, Resúmen del informe de Tomás Cortes, 1859-1886.
[32] Ibid.
[33] AHN, Ultramar, 491, Exp. 1, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Extracto del expediente, Informe de Felipe de la Corte, 1859-1886.

To make matters worse, acquiring water was getting costly for the residents of Manila and its arrabales because there were no water fountains, neither public nor private. Water for drinking and for other domestic purposes came from cisterns that were constructed that collected rainwater, water gathered from the upstream part of the Pasig river such as San Pedro de Macati, and freshwater from the springs of San Juan del Monte. However, De la Corte said that these two water sources were becoming extremely costly even for the well-to-do classes. Water unaffordability and scarcity was remarkable in the capital that fresh water could only be used for drinking and, sometimes, for food preparation. Animals were made to drink water from wells that were sweetened with honey from cane. Bathing, cleaning, and the washing of clothes could hardly be done using this fresh and uncontaminated water.

The engineer also remarked that the water deficiency of the capital did not help the city´s economic situation. The few industries which needed water consumption had to collect water from far away sources which meant great expenses. During the dry season, residents practically survived through the rationing of water and the majority of the people drank water from the Pasig river. De la Corte warned that this practice should be curtailed as this water had already been found to be contaminated and was attributed on some occasions in the development of cholera, as narrated by Cortes in 1842.[34]

Recognizing this problem, De la Corte then undertook studies, surveys, and examination of the different water sources such as rivers, springs, lakes and brooks in the immediate vicinity of Manila. The results of these studies were even published in the fortnightly magazine *Ilustración Filipina* in its section dedicated for developments in science, technology, healthy, and emerging fields. He remarked the important role of the Pasig river and the Laguna de Bay in the city´s water supply. Apart from the Pasig river, De la Corte mentioned the presence of some rivers near the capital such as the San Mateo or Marikina river and the Bulao river or Tungtung river. Other water sources that were identified included the streams of Grimpo, Diliman, and Mojón, and the fountains in San Juan del Monte. After examining the volume, quality, and flow of water of these sources, the military engineer opined that only the three rivers of San Mateo/Marikina, Bulao, and Tungtung could be considered as possible wellspring of Manila´s water supply. The streams were not excellent options because since they were only filtrations from the elevated parts of the mountain range between Manila and Marikina river, their trajectory was short and their water volume was too low for the needs of Manila´s inhabitants. It was even observed that during the dry seasons, these streams were usually dry.

[34] Felipe de la Corte, ¨Memoria sobre proveer a Manila de aguas potables por el Teniente Coronel graduado de Ingenieros, 3 de abril de 1855,¨ *Ilustración Filipina*, Manila, Año 1, nº 6 (15 de mayo de 1859), p. 50.

Like the streams of Grimpo, Diliman, and Mojón, the fountains in San Juan del Monte proved to be too insufficient and produced insignificant amount of water. Meanwhile, Bulao/Tungtung river was located to the left of the San Mateo/ Marikina river. Its water came descended from Antipolo through high ravines forming waterfalls and streams which made its waters thin and crystalline. The site, called Tungtung, where the river was located was recorded with an elevation of more than 400 feet above the sea level and a distance of some ten miles from Manila. On the other hand, the San Mateo/Marikina river was more distant from the capital and traced its origen from Balete some 18 miles from the capital.[35]

Given the elevation of Tungtung which was 285 feet higher than the highest peak of Manila to Mariquina, De la Corte thought that the best proposal was to channel water from this source. Utilizing its natural elevation, water could be conducted through canals down to Marikina, then to pipelines and aqueducts down to San Francisco del Monte and San Juan del Monte, up to the hills (*lomas*) of San Lazaro where the water reservoir and purifying fountains would be installed. From San Lazaro, water would then be distributed to the capital.[36]

One of the striking elements of De la Corte´s proposal was the incorporation of a filter system in the water deposit. Once water is conducted from the aqueducts to the reservoir, it would pass by a filter of layers of sand and carbon that would eliminate all forms of impurities and bad odor. The military engineer presented the plan of conducting water from Tungtung to the water reservoir in the hills of San Lazaro with a budget proposal amounting to 200, 000 as presented in the table below.

Construction Work	Amount in pesos
For the construction of 10, 000 feet mines	15, 000
For the construction of two double wells of 180-foot-deep hydraulic mortar coatings	2, 000
For the construction of 20 log wells	3, 000
For the acquisition and construction of 28, 000 feet of iron pipes	98, 000
For the acquisition and construction of 46, 000 feet of clay pipes	46, 000
For the construction of ponds and filter fences and other accessories	12, 000
For clay pipes and other tubes for the distribution of water	10, 000

[35] Ibid., p. 51.
[36] Felipe de la Corte, ¨Memoria sobre proveer a Manila de aguas potables por el Teniente Coronel graduado de Ingenieros, 3 de abril de 1855,¨ *Ilustración Filipina*, Manila, Año 1, nº 8 (15 de junio de 1859), pp. 67-68.

For other tools and contingency expenses	10, 100
Honorarium fees	3, 900
Total	**200, 000**

Table 3: Budget for the necessary works for the conduction of potable water from Tungtung to the water reservoir and distribution in the hills of San Lazaro
Source: Memoria sobre proveer a Manila de aguas potables por el Teniente Coronel Felipe de la Corte, 1855[37]

Perhaps cognizant of the fact that the amount proposed was too huge for the municipal coffer, De la Corte added that if the city would still continue using the waters of the Pasig river, it would be best to exploit the one coming from the left side of the river bank but way up the stream, specifically the area of San Pedro de Macati and Guadalupe. However, he warned that the quality of water present in the immediate capital was so inferior and hazardous that purification methods using water filtrations composed of sand and carbon to improve the quality of water should be undertaken first for it to be consumable by the public.[38] The engineer noted that the water could be sourced from a location near the property of a certain Petrona de la Cruz nearby the Hacienda de Macati. From here, underground canals would be constructed. The canals would be filled with gravel and thick sand so that water would be cleaned and purified through suspension. The plan also involved the use of pumping machines to conduct water to the big ponds serving as reservoir which would then lead to the pipelines leading to the distribution of water to the capital.

De la Corte then proceeded in providing a highly technical and mathematical discussion on how machine pumps would be used to generate and distribute 144, 000 cubic feet of water in 24 hours. This was equivalent to producing 100 cubic feet of water per minute. Actually, De la Corte no longer undertook a population survey of Manila and the arrabales in 1855. Using the population data that was provided by Cortes in 1845, De la Corte´s assumption was that there was continuous increase of the capital´s population in the past decade. To address this mater, he added 24, 000 cubic feet to the proposed 120, 000 cubic feet daily estimate of Cortes in 1845. For this proposal to be realized, the following budget proposal was presented to the colonial government should it decide to conduct water from San Pedro de Macati.

[37] Ibid. ¨Memoria sobre proveer a Manila de aguas potables por el Teniente Coronel graduado de Ingenieros, 3 de abril de 1855,¨ *Ilustración Filipina*, Manila, Año 1, nº 9 (1 de julio de 1859), p. 75.
[38] Ibid. (15 de julio de 1859), p. 83.

Construction Works/ Materials to be Used	Amount in pesos
For 12 rotation pumps not counting the suction and repulsion tubes	7, 200
For 1,000 feet of 9-inch diameter iron tubes and their placement	4, 000
For gears of 12 meters and their pinions	4, 800
For 12 ordinary wheels with 10 levers and their shaft and placement	4, 000
For the construction of a 50-ft wide and 600-ft-long roof-on-deck where the 12 pumps will be placed	18, 000
For the construction of a roof-on-deck for stables and rooms of guards	5, 400
For the construction of ponds and filters	12, 000
For the acquisition of 30,000-ft of ordinary clay pipes	30, 000
For the distribution pipes to the capital	10, 000
For other materials and accessories	4, 6000
Honorarium fee	2, 000
Total	**102, 000**

Table 4: Budget for the necessary works for the pumping and conduction of water from Pasig river in San Pedro de Macati to Manila and its arrabales
Source: Memoria sobre proveer a Manila de aguas potables por el Teniente Coronel Felipe de la Corte, 1855[39]

Comparing the two, the San Pedro de Macati plan was half cheaper than the Tungtung river proposal by De la Corte. However, it is undeniable that by the nineteenth century, the Pasig river was no longer the ideal water source for the capital as topographic and environmental factors, rapid urbanization, and poor sanitation habits of the residents exponentially corrupted the waterways´ state.

Despite the different studies and proposals, nothing was materialized due to budget constraints of the capital.[40] The state of water supply in Manila was getting worse as the years went by. The poor residents depended on the insalubrious Pasig and the esteros for all their water needs. While the new waterworks system for the city was still not in sight, the colonial government asked military doctor Antonio Codorniu y Nieto, who also served as secretary of the *Junta de Sanidad*, to recommend measures on how to improve the water from Pasig river before its consumption. These instructions entitled ¨Maliuanag na aral sa paglilinis nang tubig sa ilog nang Pasig, at nang mainom nang manga tauo¨ (*Clear measures on purifying the Pasig river water for the people´s consumption*) were published both in Tagalog and Spanish. Two

[39] Ibid. (1 de agosto de 1859), p. 91.
[40] AHN, Ultramar, 491, Exp. 1, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Extracto del expediente, 1859-1886.

filtration techniques were recommended by the sanitary official. First, a vessel with holes on its base would be covered with cloth. The container would be filled with alternating layers of sand and carbon of four to six ¨inches¨ (*dedos*) each. Then this would be covered again with a *sinamay* cloth. Water was poured inside the vessel and the filtered liquid that came out of it was considered to be of better state for drinking. The second technique involved the boiling of water before filtration was done.[41] These techniques became the city´s alternative sagefuard as the city´s public health was seriously threatened.

In 1859, a royal order on 2 December 1859 ordered the analysis of the different waters outside the immediate city that could be possible sources for the capital´s supply. However, it took seven years before the results of these studies and water analysis were finally completed. The study demonstrated that the San Mateo river was the best water specimen near the capital.[42]

The increasing pleas for safe water

On 24 July 1872, the members of the city council wrote to Madrid to ask for its support for the innovative hydraulic project that would finally supply Manila with potable water. In one of its sessions, it said that carrying out a waterworks project was not only a way to show the continued path of the archipelago towards progress and material development and to initiate in the islands constructions that affirm the importance of the capital, but to also ¨assure the Spanish rule in the islands after quelling the Cavite rebellion¨ (*asegurar la dominación española en estas islas sofocando después sofocar la revolución de Cavite*). The *alcaldes* and *regidores* composed of José María Díaz (vice-presidente), Vicente Aviles (alcalde), José Reyes (alcalde), Vicente Gregorio Alberto, Antonio de Cárcer, Antonio Ayala, Antonio Casal, Zoilo Ibañez de Aldecoa, Pedro Martínez, Ignacio Fernández de Castro, José Vicente de Velasco, Antonio María Regidor, Ignacio Rocha and Bernardino Marzano (secretario) signed their names in a document that would propel heightened action for the realization of an indispensable service for the city. The same city council would form commissions that would study and push for the fulfillment of the project.[43]

[41] Archivo Franciscano Ibero-Oriental, 67/25, Decreto sobre método sencillo para purificar y hacer potable el agua del río Pasig. Acompaña en lengua indígena, 27 de marzo de 1850.
[42] AHN, Ultramar, 491, Exp. 1, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Extracto del expediente, 1859-1886.
[43] AHN, Ultramar, 491, Exp. 3, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto de conducción y distribución de aguas empleando máquinas, 1871-1874, Carta del Ayuntamiento de Manila a Su Majestad, Manila, 24 de julio de 1872.

The following year, the pleas for the urgent solution of the water crisis of the Manila came incessantly. During the summer months of 1875, the intolerable heat and insufficient rainfall exacerbated the resident´s predicament. The decay and decomposition of the Pasig river and the esteros were no longer imperceptible. The poor suburbs of the capital, especially Tondo, suffered immensely as its poverty-stricken inhabitants depended solely on the river and estuaries for water provision. Perhaps this letter of the inspector councilor (*regidor inspector*) of Tondo to the Corregidor of Manila signed on a summer day on 10 May 1875 could best echo the sanitation and public health predicament at that time and the petition to finally provide a water supply system for the city.

> As Regidor Inspector of the arrabal of Tondo and Sampaloc I present to you, Your Gentleman, that the proletarian class, or better said, the people of every arrabal are going through hardships with the scarcity of drinking water since the rivers and estuaries that are the main sources of water supply are unbearable due to their state of contamination. Perhaps it is because of some plants floating in the country known as Lia, that has been mixed compactly with the water and has corrupted it that even the fish could not withstand, because most of the rivers are covered with dead fish. Naturally, decomposing fish adds to the worsening state of the water. If you do not come in time to correct this state or if you do not provide anything better to change this, I am afraid that the local community, out of necessity, would have to always use this water for drinking as there is none other, and we would be sorry for an eventful calamity, God forbid. For this reason, in fulfillment of my duty as Inspector of the arrabales, I inform Your Gentleman, in order to create the opportune measures suitable to save the population from a forthcoming misfortune as a consequence of the insalubrity of this primary need.[44]
>
> *¨Como Regidor Inspector del arrabal de Tondo y de Sampaloc hago presente a Vuestro Señor que la clase proletaria o mayor dicho la gente de uno y otro arrabal están pasando una penuria con la escasez del agua, pues con la que se suministran para beber que es la de los ríos y esteros de una y otra parte están insoportables por su estado de corrupción, supongo que sea a causa de unas yerbas flotantes conocidas en el país por el nombre de lía, que se ha mezclado compactamente con el agua y ha corrompido que ni aun los peces mismos las han podido soportar pues la mayor parte de los ríos en que aparecen están cubiertos de peces muertos y flotantes que naturalmente al descomponerse coadyuvarán al empeoramiento del estado del agua. Si no se acude con tiempo a corregir este estado o si no se proporciona otra cosa mejor que la sustituya, recelo y temo que el vecindario teniendo siempre por necesidad que servirse de esta agua para beber por no hallar otra tengamos que lamentar alguna calamidad que Dios permita no la haya. Por esta razón en cumplimiento de mi deber como Inspector de sus arrabales y testigo presencial de lo que públicamente ocurra participo a Vuestro Señor esta novedad a fin de que si lo tiene a bien haga presente a nuestra primera autoridad y al Excelentísimo Ayuntamiento para que en vista de lo manifestado y que pasa en estos arrabales de mi cargo así como públicamente en todos*

[44] AHN, Ultramar, 491, Exp. 3, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto de conducción y distribución de aguas empleando máquinas, 1871-1874, Carta del Regidor Inspector de Tondo y Sampaloc al Corregidor of Manila, 10 de mayo de1875.

los demás, tomen las medidas oportunas que crean convenientes para salvar a la población de una próxima desgracia consecuencia de la insalubridad de este ramo de primera necesidad.

C. The Manila Waterworks and Nineteenth-Century Hydraulic Engineering

Genaro Palacios and the techno-scientific studies

In November 1868, the civil engineer (*ingeniero de camino*) Genaro Palacios undertook the task of drafting a project proposal to conduct water to Manila and its suburbs. Palacios and the other engineers of the IGOP were central in the final materialization of the Manila waterworks project. Palacios was one of the first five engineers who arrived in the Philippines in 1867 after the IGOP was constituted in 1866.[45] During this time, more numbers of new breed of engineers with improved formation and training were sent to the islands. Palacios was appointed as second class engineer while serving as the district engineer for the District of Vigan. In 1868, he was commissioned by the Manila city council to lead the study and planning of the water supply system for the capital. Palacios was one of the engineers who served for a long time in the archipelago (See Chapter 2). Alongside Felipe Vera Saez and Sebastian Jové y Paról who served as assistants, they commenced an immense project that would signal a new turn for the hydraulic projects in the colony. Vera Saez was appointed as *ayudante* in the islands in 1874 and asked to be assigned back to Spain in 1882 after serving eight years.[46]

If one will analyze the thousands and thousands of pages of memoirs and blueprints that were authored by Palacios and the technical recommendations made by the Consultative Board of Public Works of the IGOP and JCCP, techno-scientific knowledge appears to be the cornerstone of the waterworks project under his command. Before the Manila waterworks plan was finalized, tons of paperwork that included field studies, technical analysis, socio-economic studies, etc. had to be undertaken which included innumerable reports concerning the city´s population growth and the amount of water needed per inhabitant, per day; the origin, quality, and quantity of the water source, projection on the existing and future water consumption of

[45] AHN, Ultramar, 477, Exp. 10, Expediente personal del ingeniero de Obras Públicas de Filipinas Genaro Palacios Guerra, 1875-1885.
[46] AHN, Ultramar, 478, Exp. 14, Expediente personal del ayudante de Obras Públicas de Filipinas Felipe Vara Sáez, 1869-1894.

the city residents; different systems and buildings techniques for the conduction and distribution of water; and the financial considerations for the project to be actually sufficiently-funded.

One of the results of these various investigations was the production of detailed maps and plans on the geological and topographical terrain of Manila and its environs. For instance, Palacios and the techno-scientific experts devised the map below to reflect the different water sources in Manila and its vicinity.

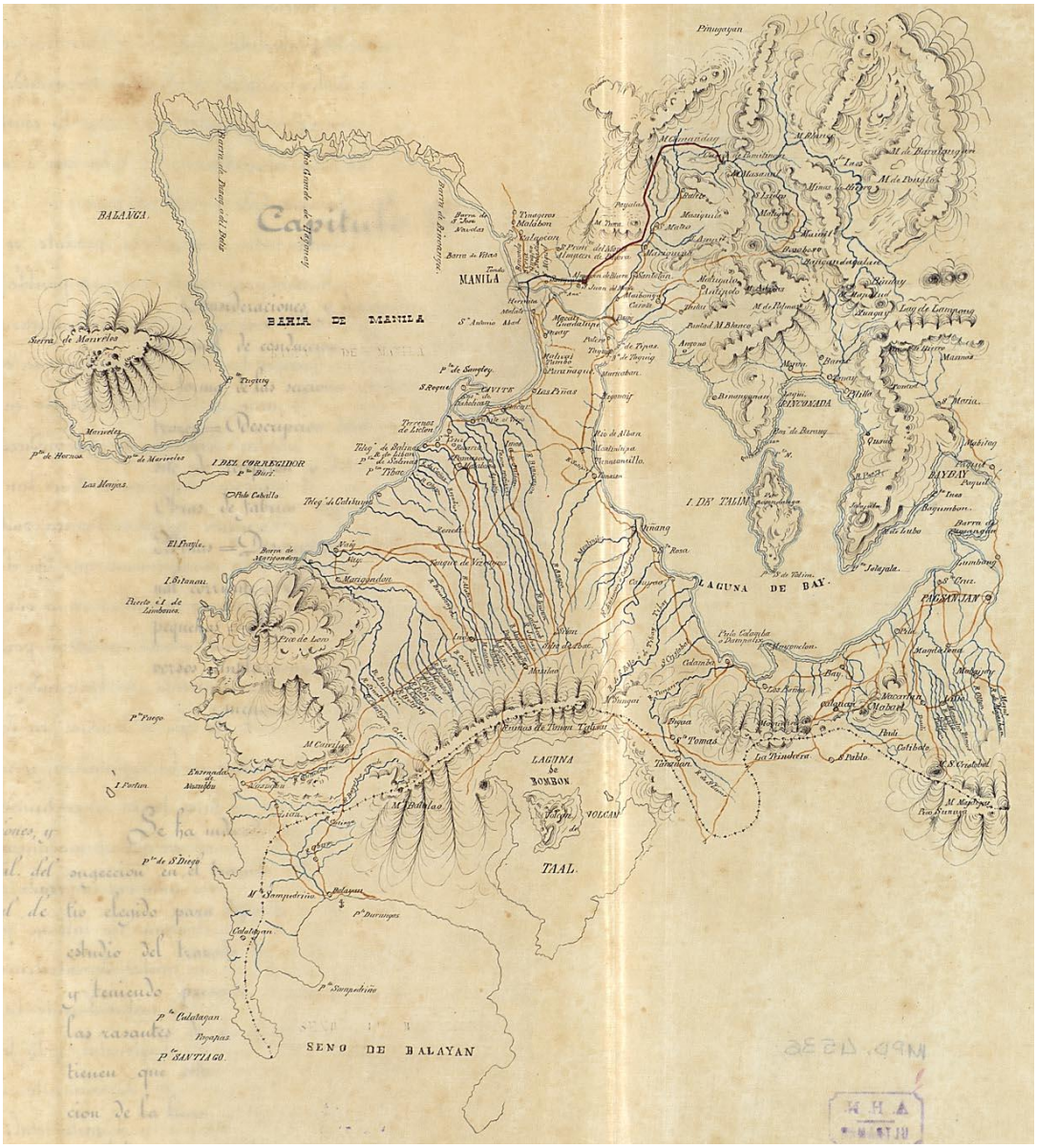


Figure 1: A topographical map of Manila and its nearby provinces showing the different water sources in the area
Source: AHN, Ultramar, MPD.4536[47]

[47] AHN, Ultramar, MPD. 4536, Proyecto de conducción de aguas a Manila: Plano general del trazado de la conducción por Genaro Palacios, 30 de noviembre de 1869.

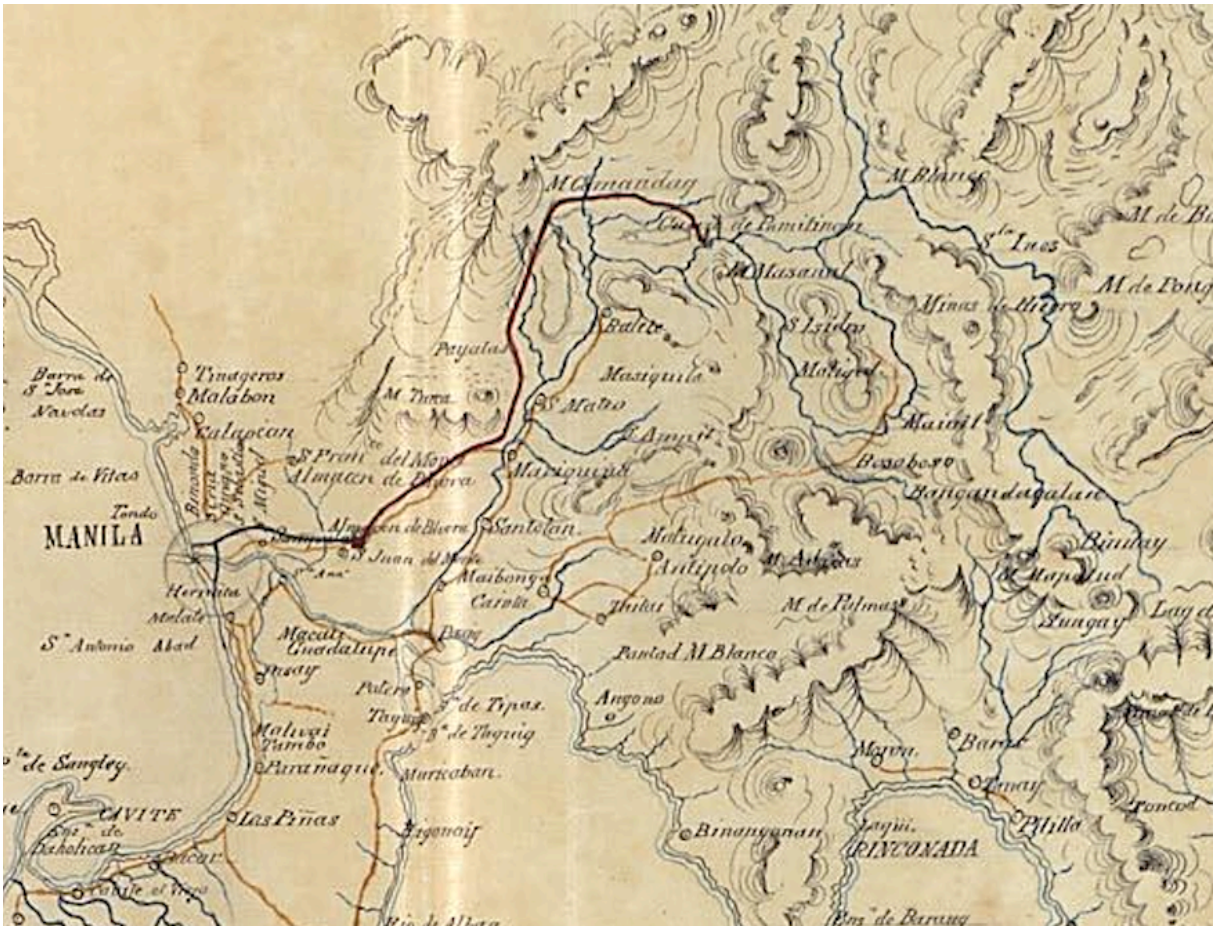


Figure 1.1: A topographical map of Manila and its nearby provinces showing the different water sources in the area. Special attention was given to the flow of water of Santolan, Marikina, San Mateo river which were tapped for the Manila waterworks project.

Unlike the previous studies of Cortes and De la Corte that only depended on the water turbidity to determine the water quality, more advanced forms of inquiry were undertaken by the second half to the last quarter of the nineteenth century. Water samples were eventually subjected to chemical analysis and laboratory tests. For instance, a commission composed of Manila-based pharmacists-chemists led by Don Juan Escosura, Manuel Manzaneque and Guillermo Borries who provided the apparatus and laboratory analyzed the conditions of the different water sources in the capital. These men of science served as members of the *Subdelegación de Farmacia* and the *Junta de Sanidad* in the Philippines during the mid-nineteenth century. They furnished Palacios with a report that detailed the presence of organic and inorganic matter in water, such as the presence of salt, lime, calcium chloride, magnesium, lead acetate, etc.[48] The table below is a summary of the water tests that the commission undertook.

[48] AHN, Ultramar, 491, Exp. 2, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Sobre un legado dejado para surtir de agua potable a Manila, 1859-1869.

Water Source	Summary Findings
Water from San Mateo river in Marikina	Contains little amount of salts; Evaporation of 750 grams resulted to a residue of 0.10 to 2 grams; Salts consist of lime carbonate to a state of carbonate and calcium chloride; Contains some organic matter; Gives a very light precipitate due to lead acetate and dissolves perfectly the soap
Water from San Mateo river in Santolan	Contains small amount of salts; Salts consist of lime carbonate to a state of carbonate and calcium chloride and some sulfate; It also contains organic matter; Lead acetate gives a more pronounced precipitate than in the previous one; Soap dissolves in it completely.
Water from the stream of Tungtong	Has greater quantity of salts: Evaporation of 500 grams has left a residue of 0.15; It contains lime carbonate to a state of bicarbonate, with indications of magnesia in small quantity, very little organic substance. The soap dissolves but is somewhat cloudy; Gives a more abundant precipitate compared to the previous ones due to the lead acetate.
Water from San Pedro de Macati area of the Pasig River	Has greater amount of residue seen in the process of evaporation since 0.18 residue is obtained from 500 grams. Contains lime, carbonate, indications of magnesia; Large quantity of organic substances; Lead acetate precipitates in abundance and completely dissolves soap. This water could be considered as potable concerning the number of salts, but it contains a large amount of organic matter, therefore, water can only be used for drinking if it goes through the process of filtering water through layers of carbon.

Table 5: Summary report of the water analysis from different water sources in Manila and its environs
Source: Costelo, 2020. Elaborated from the data collected in AHN, Ultramar, 491, Exp. 2.

The table shows that the sample from Marikina in the upper part of San Mateo river proved to be of the highest quality if analyzed by the presence of organic matter as well as residue in its sample. This chemical analysis also affirmed that the water from the Pasig river, even if it was collected from the upstream area of San Pedro de Macati, was no longer safe as drinking water per sé. The water from these areas that were typically sold by water carriers (*aguadores*) was only safe after filtration has been done. In short, the residents´ belief that unfiltered and unboiled water from San Pedro de Macati was still safe for drinking was debunked by these laboratory results. It was clear for Palacios that the mere physical appearance

and odor of the water were not sufficient basis in distinguishing the best water source for Manila. Given this data, the very high presence of organic materials in the water sample from the Pasig River led to the specialists´ recommendation of carrying out purification processes before it would be ideal for the public´s use.

Palacios´ plan was heavily influenced by the emerging studies and works of engineers who pioneered some of the most essential sanitary infrastructures in Spain and France. For example, he repeatedly cited the works of José Morer and Jules Dupuit in the Manila waterworks blueprint.[49] Palacios was guided by the studies of engineer Morer, his former professor and colleague in the *Escuela de Caminos* in Madrid. Morer is considered part of the group of hygienist engineers (*ingenieros higienistas*) that emerged in Spain during that time. Morer joined the Canal de Isabel II project in Madrid and led the construction work of the conduction of the waters from Lozoya river, water distribution, and the city´s sewerage system.[50] Palacios also cited the works of French-trained engineer Jules Dupuit who published different works on hydraulics infrastructures, water supply and sewers, and the best state of water for drinking purposes.[51] Recognizing the need to compare the different experiences of cities with established waterworks system, Palacios used chemical and laboratory results of the water samples done in Manila to compare which water source met the water quality standard in different key cities in the world such as Paris, Lyon, Toulouse, Geneva, London, New York, Madrid, as well as water sources in the Spanish territories of Valencia and Jerez de la Frontera. The following table was one of the supporting data that the engineer included in the waterworks project proposal that justified his selection of water source to be distributed to the capital and the suburbs.

Water Sources	Residue in grams per liter
Water in Paris from the Seine in Chaillot	0.432
Water in Paris from Belleville	0.527
Water in Paris from St Germain.	2.520
Water in Paris from the wells of Greinville	1.194
Water in Paris from the Canal de l'Ourcq	0.149

[49] AHN, Ultramar, 491, Exp. 2, Genaro Palacios, Proyecto de Conducción de Aguas a Manila, Documento no. 1 Memoria Descriptiva, 30 de noviembre de 1869.
[50] Pedro Navascues Palacio, ¨Madrid, Ciudad y Arquitectura 1808-1898,¨ *E.T. S. Arquitectura* (*UPM*), 1994, p. 419.; José Ramón Navarro Vera, ¨Ténicas de saneamiento urbano en España. Siglo XIX. El tiempo de los ingenieros higienistas,¨ *Revista del Colegio de Ingenieros de Caminos, Canales y Puertos,* no. 31 Saneamiento, I (Año 1996).
[51] François Vatin, Jean-Pascal Simonin, and Luc Marco, *The Works of Jules Dupuit: Engineer and Economist of the French XIXth Century* (Saint-Denis: Édi-Gestion, 2016), p. 26.

Water from the river of Strasbourg	0.590
Water from the Rhine in Geneva	0.232
Water from the Rhine in Lyon	0.182
Water from the Garona river in Toulouse	0.136
Water from Doubs in Besançon	0.230
Water from Lozoya in Madrid	0.0304
Water from a spring in Dijon	0.2607
Water from Croton river in New York	0.0390
Water from the fountains in Valencia (Spain)	0.520
Water from the Guadalete river joining Mayaceite river (Spain)	0.701
Mayaceite river (Spain)	0.537
Water from the spring of Tempul used in the water system of Jerez (Spain)	0.318
Water from the spring of Molino (Spain)	0.221
Water from the spring of Piedad (Spain)	0.206
Water from the San Mateo river in Marikina	0.1333
Water from the San Mateo river in Santolan	0.200
Water from the stream of Tungtong	0.300
Water from Pasig River	0.360
Table 6: Comparison of water sources in the various waterworks projects in select cities *Source:* AHN Ultramar, 491, Exp. 2[52]	

These data reflected an increasing exposure of the colony to the emerging know-hows through the techno-scientific experts as well as the growing reliance on scientific knowledge in the studies and plans for the colony´s public works projects. These data served as a guide for the engineers and sanitary reformers at that time. This growing acknowledgement on the important of science-based studies would be further seen by the late nineteenth century as advances in bacteriology would slowly be incorporated in matters relating to sanitary infrastructures an public health with the creation of the *Laboratorio Municipal de Manila* in 1887.[53]

Aside from water quality, the water capacity of the source was also tested through months-long studies. Palacios and his team had to observe and record the meteorological characteristics of the islands to determine the dry and wet seasons. Studies had just started when massive flooding occurred in September 1867 which was followed by a drought until May of

[52] AHN, Ultramar, 491, Exp. 2, Genaro Palacios, "Proyecto de Conducción de Aguas a Manila, Documento no. 1 Memoria Descriptiva", 30 de noviembre de 1869.

[53] Francisco Javier Martínez, ¨Bacteriología y Nación en Filipinas: El Laboratorio Municipal de Manila, 1887-1898,¨ in Elizalde and Huetz de Lemps (2020), in press. Martínez´ excellent study showed that the last decades of Spanish rule witnessed the beginnings of laboratory medicine in the Philippines, and more specifically, to the development of bacteriology and parasitology. This study debunks the traditional viewpoint that these fields of science and medicine were exclusively attributed to the American rule in the islands.

1868. Palacios recorded that after the September 1867 flooding that submerged Luzon and Manila, the rain did not come anymore in the capital and its surrounding provinces until May in 1868. It may have rained once, but the severe lack of rainwater drained all the cisterns in the capital and its suburbs. The six-month drought that occurred in the last months of 1867 up to the first few months of 1868 was utilized by Palacios and his team to determine the San Mateo river´s lowest level of water through putting up several gauging stations at its various points.[54] According to Palacios´ observations, the river still held a considerable supply of water even in during the peak of the drought. It was capable of elevating a half cubic meter of water or 500 liters per day.[55] Frequent typhoons and earthquakes always hampered the smooth implementation of the planning and constructing phase of the project, especially the infamous 1880 earthquake that left the Luzon island with damages to life and infrastructures.[56]

One of the contentious aspect in the planning stage was the approximation of the sufficient amount of water supply for the city. While cognizant of the 1845 population study of Cortes, Palacios in the 1860s chose to rely on the population data provided by the 1865 Guía de Forasteros as shown in Table 7.

	Population according to the Guia de 1865	**Approximated number of inhabitants**	**Daily Consumption in cubic meters**	**Cosumption per second in cubic meters**
Sampaloc	8, 058	8,700	522	0.012082
San Miguel	8, 864	9, 700	582	0.013471
Quiapo	4, 960	6, 000	360	0.008332
Santa Cruz	14, 528	17, 500	1, 050	0.024304
San Jose / Trozo	26, 266	30, 000	1, 800	0.041664
Binondo	27, 710	30, 400	1, 824	0.042220
Tondo	6, 052	7, 000	420	0.0009721
Manila	9, 390	9, 500	570	0.0013193
San Fernando de Dilao/ Paco	7, 484	7, 500	450	0.0010416
Ermita	8, 230	8, 200	492	0.011388
Malate	13, 4990	13, 500	810	0.018748

Table 7: Population data used by Genaro Palacios in the approximation of the water supply for Manila
Source: AHN, Ultramar, 491, Exp.3[57]

[54] AHN, Ultramar, 491, Exp. 2, Genaro Palacios, "Proyecto de Conducción de Aguas a Manila, Documento no. 1 Memoria Descriptiva", 30 de noviembre de 1869.
[55] Ibid.
[56] AHN, Ultramar, 471, Exp. 1, Daños causados en construcciones de Luzón por los terremotos de julio de 1880, 1880-1881.
[57] AHN, Ultramar, 491, Exp. 2, Genaro Palacios, Proyecto de Conducción de Aguas a Manila, Documento no. 1 Memoria Descriptiva, 30 de noviembre de 1869.

Palacios´ incorporated in this data the presence of around 10, 000 Chinese in the capital and around 1, 500 non-Spanish European residents.[58] According to the 1865 *Guía de Forasteros*, Manila and its suburbs registered a total of 147,954 inhabitants with 109,249 inhabitants on the right side of the river bank and 38,605 on the left. Palacios remarked that this population data was way less than the actual numbers of the city. He said that given the rapid population growth of the city, the figures could have already reached 222,000 inhabitants. However, Palacio´s made a miscalculation in this part. While he was right that 214,000 did not truly reflect Manila´s population at that time, he, however, underestimated the city´s growth since in 1845, military engineer Cortes reported that the city´s demographic data was already around 214,000. (See Table 2) The decrease or slow increase of the city´s population might have been true in 1865 as the effects of the cholera epidemic and earthquake of 1863 were greatly felt. However, despite these plunges in mortality rate, Manila´s population proved to have soared through the rest of the century.

Relying on these statistics, Palacios approximated the average daily consumption of every inhabitant at 40 liters per day which translated to the need to conduct 8, 880 cubic meters of daily water supply or 103 liters of water per second. This was a great improvement from Cortes´ 10 liters/inhabitant/day estimate. How did Palacios reach the 40 liters of daily water assignation per individual? He presented the following approximation: 24 liters of water or *media tinaja* for drinking, cooking and food preparation, and bathing; 6 liters for washing of clothes; 2 liters dedicated for animals like horses; 6 liters for latrines and washooms; and 2 liters for industrial use. One may find these calculations of Palacios a bit arbitrary and unscientific.[59] Towards the late nineteenth century and early twentieth century, these (mis)calculations would be felt as potable water supply instantly became inadequate to meet the needs of a city that was growing exponentially.

[58] AHN, Ultramar, 491, Exp. 3, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto de conducción y distribución de aguas empleando máquinas, 1871-1874.
[59] AHN, Ultramar, 491, Exp. 3, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto de conducción y distribución de aguas empleando máquinas, 1871-1874, Anteproyecto de abastecimieno de aguas potable a Manila conduciendo solo 8, 880 metros cúbicos diarios empleándose maquinas elevatorias, 7 noviembre de 1872.

Conducting and distributing water: The techno-scientific plan

The first plan of the water system that was designed by Palacios in 1869 was a complex system comprised of high Roman aqueducts approximately 27 kilometers in length. Water would be drawn from the San Mateo river where a dam would be constructed in Montalban (currently Rodriguez, Rizal). From the dam, water would be conducted to a water reservoir in San Juan del Monte. Aided by gravity, water pipes would be placed in the high and mountainous areas of Montalban and Marikina to direct clean water from the San Mateo River to San Juan del Monte. [60] This original design of Palacios was disapproved due to two principal factors: First, the engineers who examined the proposal worried about the structural integrity of the Roman aqueduct system, taking into consideration the frequency of calamities such as earthquakes and typhoons; and second, the erection of these structures which was proposed to amount to 12,250,000 pesetas was just too huge an amount for the capital and the colony in general.[61]

[60] AHN, Ultramar, 491, Exp. 2, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Sobre un legado dejado para surtir de agua potable a Manila, 1859-1869.
[61] Mas y Otzet (1882), p. 59.

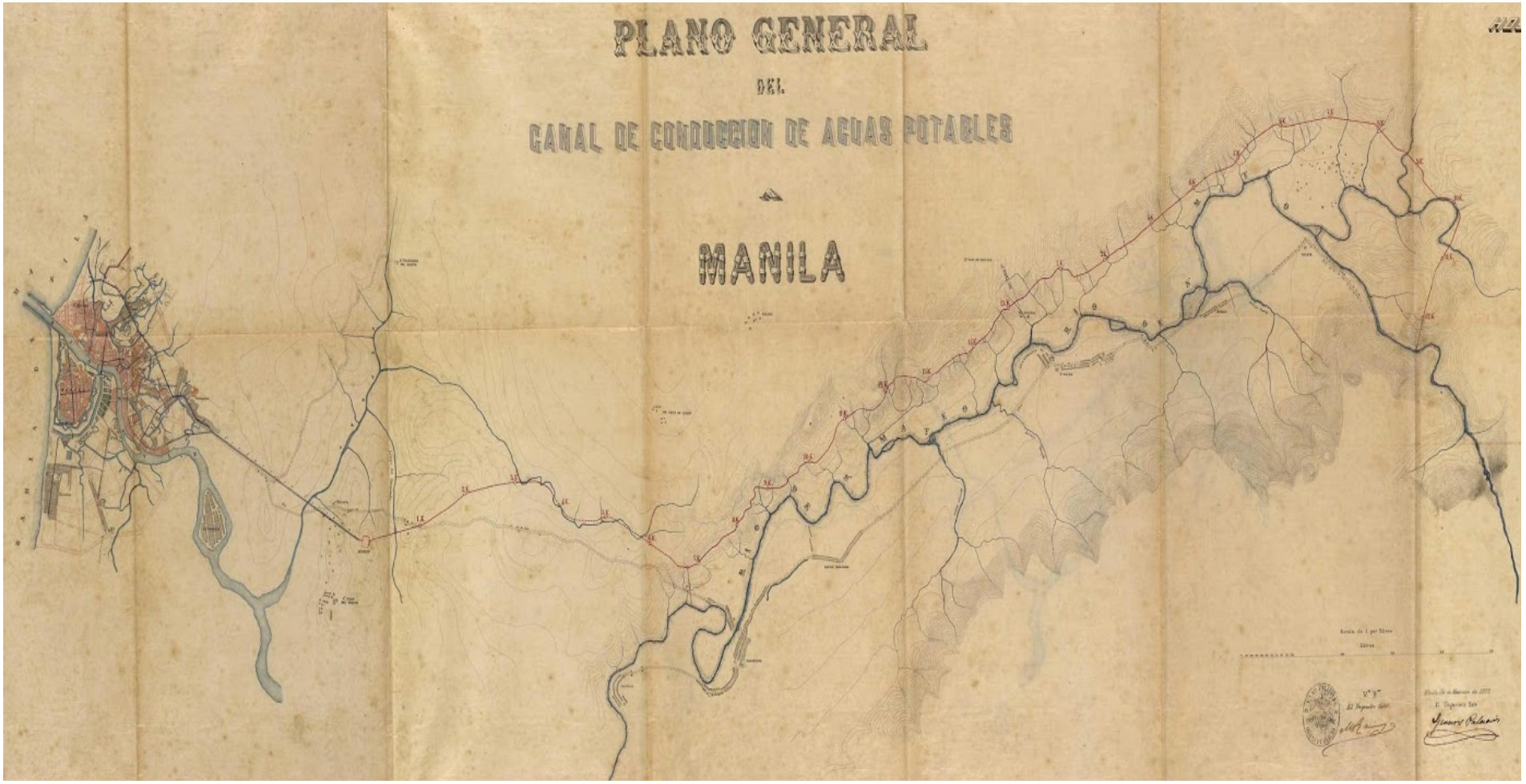


Figure 2: The first unapproved proposal of Genaro Palacios for the Manila waterworks showing the 27-kilometer aqueduct plan from mountains of Montalban to Manila

Source: AHN, Ultramar, MPD, 4539, Proyecto de conducción de aguas a Manila: ¨Hoja Nº 1: Plano general del canal de conducción de aguas potables a Manila¨, 30 de noviembre de 1869.

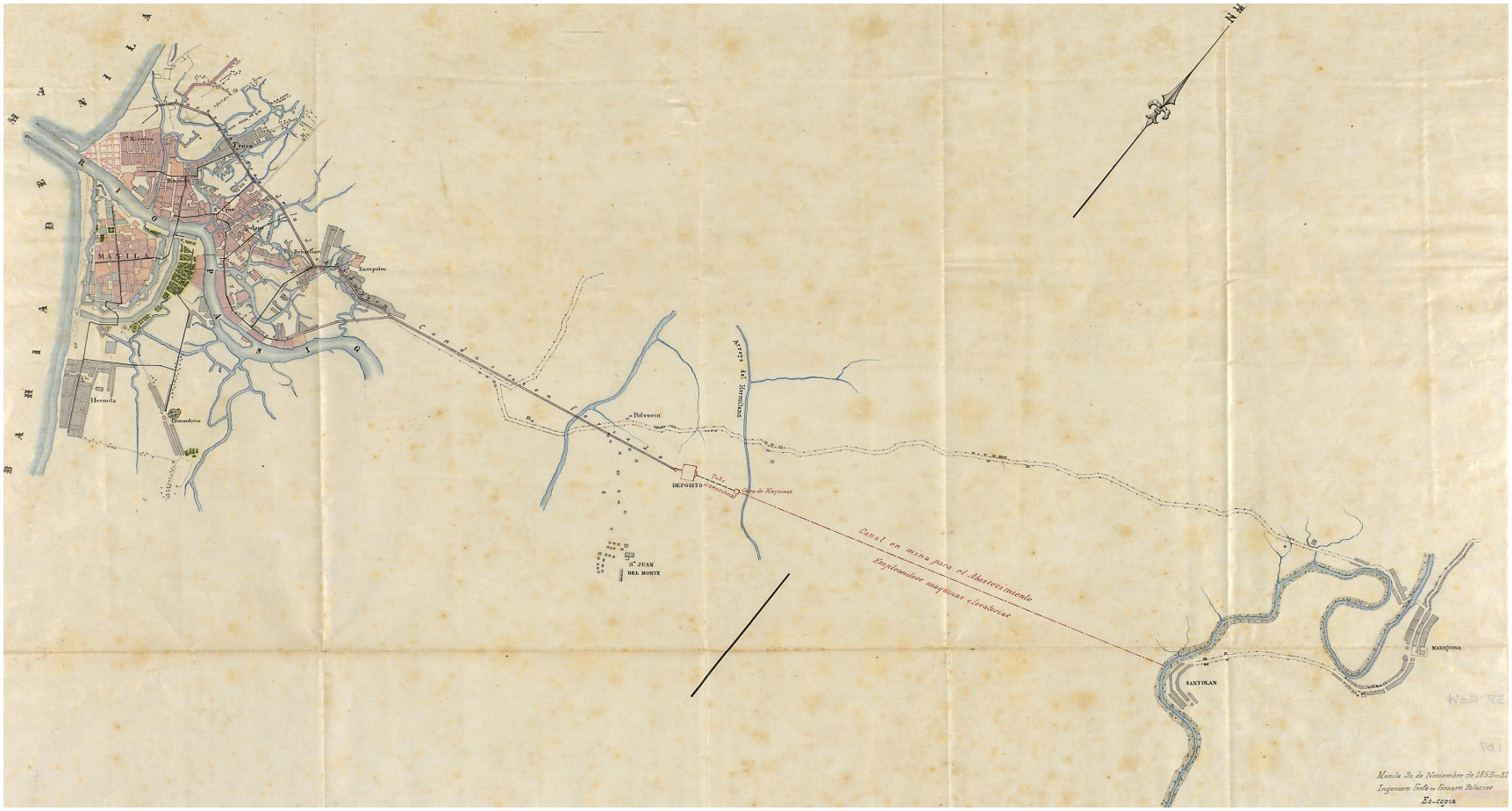


Figure 3: The second proposal (*anteproyecto*) and final Manila waterworks plan showing the conduction in the Santolan pump station of water from the San Mateo/Marikina river, the El Depósito reservoir, and the principal distribution line from Sampaloc to the rest of the Manila suburbs. mountains of Montalban to Manila

Source: AHN, Ultramar, MPD. 4537, Proyecto de conducción de aguas a Manila: Plano de Manila y sus arrabales con el trazado de la conducción, 30 de noviembre de 1869.

Palacios presented a less expensive alternative plan which consisted of drawing water from one of the lower parts of San Mateo River (Marikina River today, particularly in the area of Libis), to a pipeline leading to a water reservoir in San Juan del Monte, then to the water distribution lines in Manila and its arrabales. This alternative plan as shown in Figure 3 became the final blueprint for the Manila water supply system although it was only on 30 April 1874 that Palacios submitted the specific details of the plan. This plan went through examinations and reviews by the Manila-based Junta Consultativa de Obras Públicas (hereafter, JCOP). On 19 October 1871, it went through the evaluation and assessment of the Madrid-based Junta Consultativa de Caminos, Puertos y Canales (hereafter, JCCP) which gave modifications to include other improvements in the plan.[62] On 10 June 1875, a Royal Order approved the 1874 waterworks plan with some modifications.[63]

The less economical second design, which used pumping machines to conduct water, amounted to 3,685,296.21 pesetas. This proposal was the one supported and approved by the colonial authorities both in the Philippines and the Spanish metropolis. This budget was divided into two. The first phase was the conduction phase with a budget of 1,842,264.88 pesetas and the second was the distribution phase which reached 1,843,031.33 pesetas.[64] Appropriating funds for this large-scale hydraulic infrastructure involved countless documentations and debates among colonial officials in the Philippines and in Spain. As previously mentioned, the principal source of the project was the Carriedo funds that had grown significantly for the past century. Pushed by the zeal of carrying out such important task, the Ayuntamiento still remarked the difficulty of coming up with the said amount. Other resources had to be tapped to cover the entire costs of the project. As a response, city councilors Marcelo Ramírez and Quintin Meynet proposed to the council the imposition of a meat tax to supplement the collection of funds for the said project. The proposal was then approved by the high colonial authorities in the Philippines.[65]

The debates concerning the financing of the project reflected an interesting turn in the administration of the colony. To obtain additional funds aside from the Carriedo funds and the meat tax, one of the suggestions was to grant the project to private companies. However, this

[62] AHN, Ultramar, 491, Exp. 3, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto de conducción y distribución de aguas empleando máquinas, 1871-1874. Informe de los ingenieros Castro, Elilla, Ribera, Ferman, Lopez, Gómez Ortega, Recarte, Barron, Mensizabal, Movellano, Marti, Espinosa, and Lopez.
[63] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, 1874-1876, No. 5 Real Orden de 10 de junio de 1875.
[64] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, 1874-1876, No. 8. Proyecto definitivo de la conducción y distribución de aguas de Manila según dispone la Real Orden de 10 de junio de 1875.
[65] Mas y Otzet (1882), pp. 59-60.

concession system would signify that everyone would have to pay for each and every one´s consumption of water. Carriedo´s last will was clear that the funds would have to be used for the water provisioning of the city´s most needy. The *Consejo de Filipinas´* views on this matter was also very telling when it pressed for the provisioning of water to the general public for free arguing that it was the municipal´s government´s responsibility to provide its habitants with this basic service.[66] In the end, three sources financed the project: the Carriedo capital, the funds of the local Treasury, and the continuation of the meat tax that was once used for the construction of the city´s slaughterhouse and market reconstructions.[67]

The first phase of conducting water began in the San Mateo River. Although the previous chemical analysis of the of the San Mateo river supported its good water quality, the consultative board of engineers in Manila and Madrid, the JCOP and the JCCP made adjustments to the original plan by including filtration galleries in Santolan to ensure that impurities and turbid water would not be drawn from the San Mateo/Marikina river.[68] Water from this source would then be pumped by steam-powered engines located in Santolan. These machines should be able to pump 103 liters of water per second for the daily consumption of 220,000 inhabitants.[69] According to the plan, the pumping station would use Cornish machines, an English technology developed in the nineteenth century, that used coal to generate high pressure vessels that would elevate and draw off water. Figure 4 shows the design of the machines that were employed in the Santolan pumping station.

Then from the pumping station, water was drawn by the five-kilometer cast-iron pipes towards *¨El Depósito¨*, a water reservoir located on the hill of San Juan del Monte. This underground reservoir designed by Palacios had a total capacity of 56,000 cubic meters of water daily. According to Palacios, the water reservoir´s unique location and it´s sufficient elevation was necessary to be able to pump and supply water to the capital.[70]

[66] María Dolores Elizalde, ¨La Difícil Tarea de Modernizar un Imperio: El Consejo de Filipinas ante las Reformas Planteadas en el Archipiélago, 1870-1880,¨ in Elizalde and Huetz de Lemps (2020), in press.
[67] Mas y Otzet, p. 60.
[68] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, 1874-1876, No. 4 Informe de la Junta Consultativa de Caminos, Puertos y Canales, Madrid, 20 de mayo de 1875.
[69] Palacios, tomo I (1878), p. 154.
[70] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, 1874-1876, No. 4 Informe de la Junta Consultativa de Caminos, Puertos y Canales, Madrid, 20 de mayo de 1875.

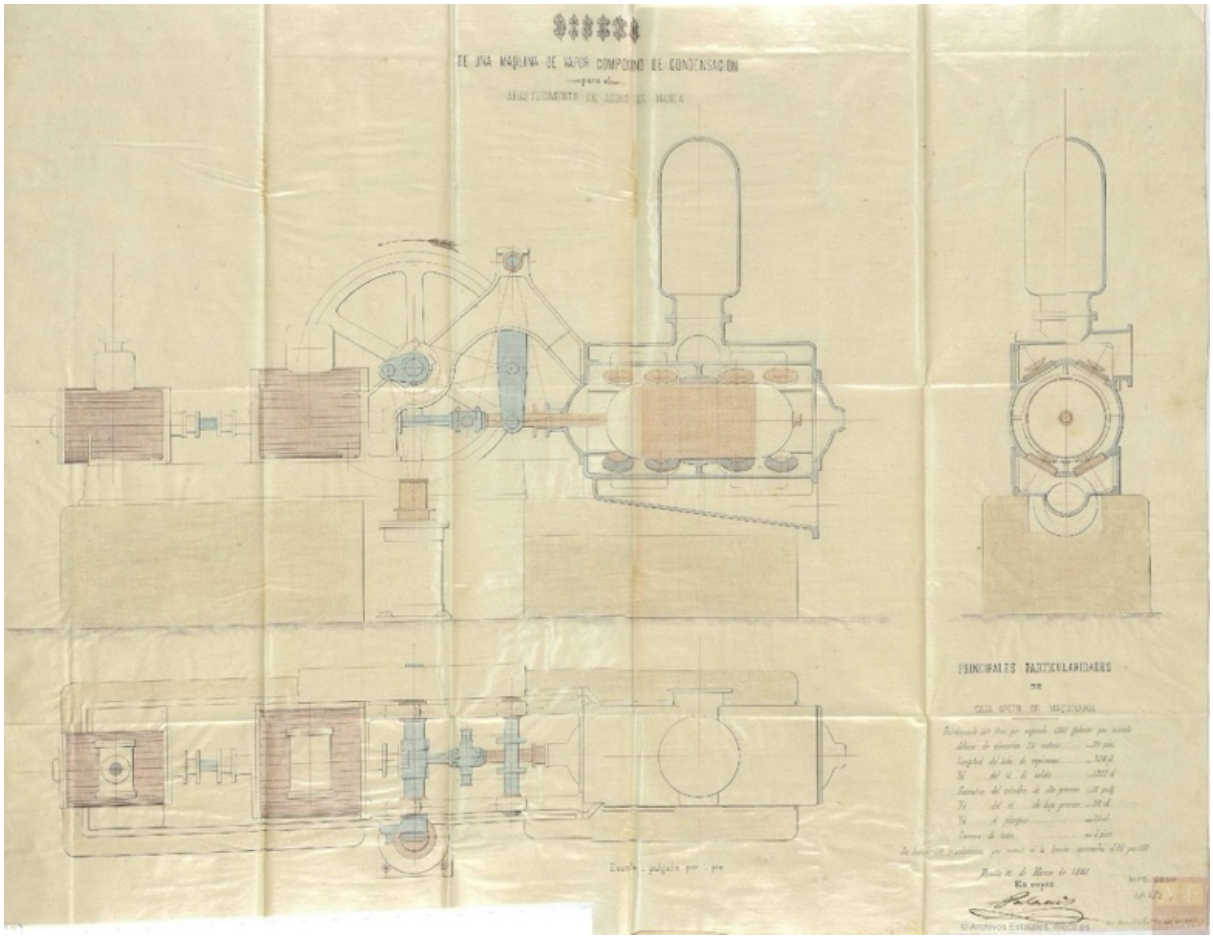
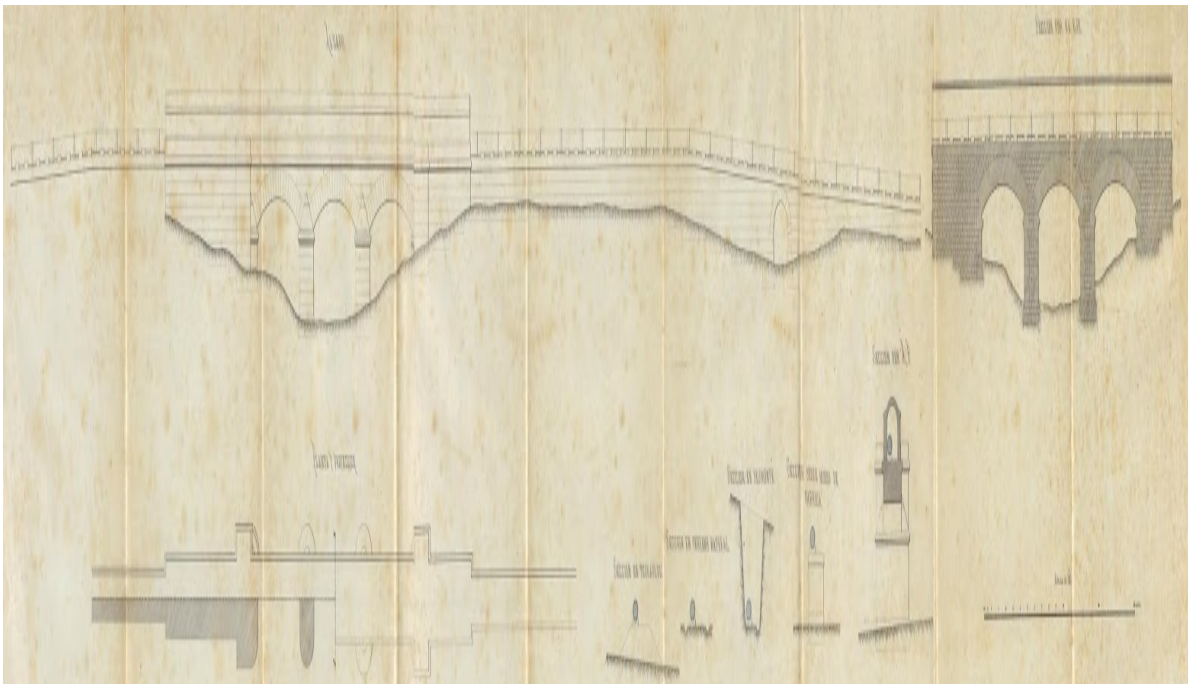


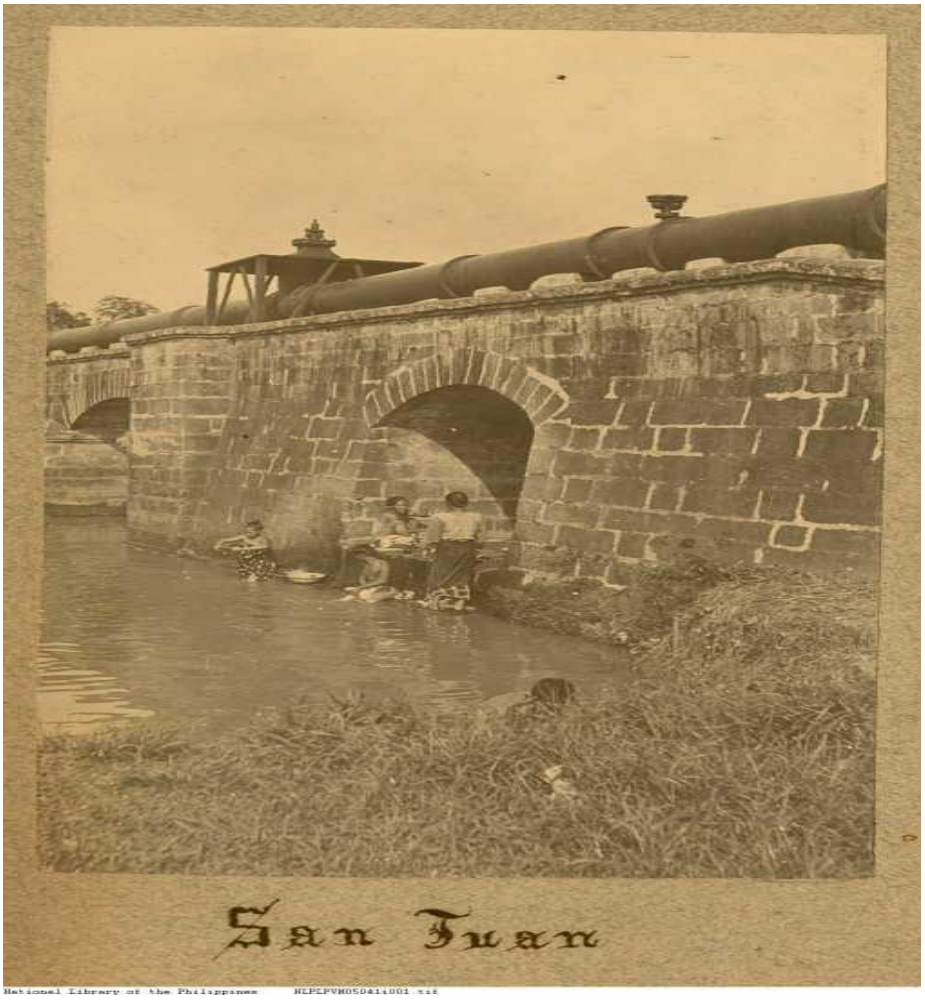
Figure 4: Design of a condensation compound steam-engine used to pump water in Santolan station
Source: AHN, Ultramar, MPD. 4640[71]

[71] AHN, Ultramar, MPD. 4640, Proyecto de conducción de aguas a Manila: "Diseño de una máquina de vapor compound de condensación para el abastecimiento de aguas de Manila, 15 de marzo de 1881.

From *El Depósito*, water was forcefully conducted to a line of cast-iron pipes of varied measurements and diameters along a purchased right-of-way to the city. Aqueducts, bridges, and overpass had to be constructed so that pipelines could cross from the various rivers, streams, and estuaries from the San Mateo river to the distribution pipes towards the capital. Palacios and the IGOP engineers designed many plans such as those that were constructed in the San Juan del Monte river as well as in the streams of Ermitanyo, Ulat, Sugnason, Raysa, Tanig, Talanay, Payatas, Calamian, Bocana, Lucban, Jahamogoan, Bacsacan at Maipas. [72] Figures 5 and 6 show the plan and photo of the San Juan aqueduct, a crucial hydraulic infrastructure for the continuous conduit of water of the Manila waterworks system. Plans for other floating bridges (*pontones*) were also designed such as the one intended for the estero of Sampaloc. (See Appendix, Chapter 5, A)



[72] Genaro Palacios, "Proyecto de abastecimiento de aguas de la ciudad de Manila," *Revista de Obras Públicas,* 26, tomo I, 14 (1878), p. 165.



Figures 5 and 6. San Juan (del Monte) aqueduct plan (first) and a photo showing the constructed aqueduct in the late nineteenth century (second)
Source: AHN, Ultramar, MPD. 4607[73] (first) and National Library Collection, Luther Park Collection (second)

After conducting the water from the river source, the second part of the waterworks system was the water distribution. The primary distribution lines began in the arrabal of Sampaloc, where the iconic Carriedo fountain was put in place. From here, the pipeline crossed Gunao Bridge leading to the suburb of Quiapo and Santa Cruz. Then, water lines with smaller water pipes ran through the other suburbs on the right bank of Pasig such as San Miguel, Tondo and Binondo. Meanwhile, the left side of the bank which included Intramuros and the suburbs of San Fernando de Dilao/Paco, Hermita were supplied with water by laying down pipelines that had to cross the Pasig river. Palacios proposed that two pipelines be placed, the first through

[73] AHN, Ultramar, MPD. 4607, Puente acueducto del estero de San Juan del Monte y secciones de conducción forzada, 1874.

España Bridge and the other through the wooden bridge traversing the island of Convalecencia.[74]

Palacios in his memoir attempted to create a system of water distribution in Manila and its suburbs through the identification and classification of streets from which he would base the type of pipelines that would traverse the different thoroughfares of the suburbs. The increasing legibility of Manila in the last quarter of the nineteenth century definitely aided the waterworks projects as street names and street designations became important indicators and markers of the city´s condition. Through this technique, the engineers were able to identify the spaces where pipelines where to be placed. For instance, in Binondo, the distribution lines were identified in the following manner as proposed in the project plans of Palacios:

> Binondo has large spaces that demand various [distribution] lines that we will point out: one line by the street of San Jacinto to the street of Escolta, the other from Tetuán Street to the street of San Jacinto, another from the front of the door of the Binondo Church in Nueva Street leading to the dock of San Gabriel which is linked to the line of Escolta Street, another towards Jolo Street in the plaza, another from the foot of the bridge to the dock of the new customs office that is under construction, another from the Divisoria to the Meisic [tobacco] factory, and lastly from the street of Santo Cristo on the side of the Divisoria market to the foot of the Jolo Bridge.[75]
>
> *Binondo tiene grandes espacios que exigen diversas líneas que vamos a señalar: una por la calle de San Jacinto a la calle de Escolta, la línea de la Calle de Tetuán a la calle de San Jacinto, otra desde la frente de la puerta de la Iglesia por la calle Nueva hasta el muelle de San Gabriel enlazada con la línea de la Escolta, otra hacia la calle de Joló en la plaza, otra desde la bajada del puente hasta el muelle de la nueva Aduana en construcción, otra desde la Divisoria a la Fábrica de Meisic, y por último otra desde la calle de Santo Cristo por el costado del mercado de la Divisoria hasta la bajada del puente de Joló.*

From this alone, one can infer that Palacios prioritized the spaces where people typically converged in identifying where to place the distribution lines. These included the foot of the bridges, the major docks, the church and plaza, the market, and industries such as the tobacco factory. Naturally, the technical team also considered the number of inhabitants as determinant whether distribution lines should pass through a particular street. This judgment clearly reflected in the case of San Miguel as Palacios wrote:

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[74] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, 1874-1876, No. 8. Proyecto definitivo de la conducción y distribución de aguas de Manila. It was unclear, however, if these two lines were materialized since only one aqueduct was reflected in the distribution of pipelines line.
[75] Ibid.

> San Miguel has three empty spaces: the one immediate to the estero of Sampaloc is unpopulated; the other space that traverses Aviles street and leads to the estero of San Miguel only needs a small [distribution] line for the neighborhood since the neighbourhood is gathered on the Aviles street beyond Malacañang street, and lastly in its center is the San Miguel estuary and an unpopulated area that therefore does not need service.[76]
>
> *San Miguel presenta tres espacios vacíos: el uno inmediato al estero de Sampaloc está despoblado; el otro que cruza la calzada de Aviles y que se corre hasta al estero de San Miguel solo necesita una pequeña linea para el barrio que se está agrupando en la calzada de Aviles más alla de la calle de Malacañan, y el último tiene en su centro el estero de San Miguel y una zona despoblada que por lo tanto no necesita servicio.*

The pipelines were of varied measurements and diameters. The technical report of Palacios provided impeccable data concerning these variations, specifying the streets and location of the principal pipelines and the secondary ones. Changes in pipeline size had to be done depending on the characteristic of the thoroughfare and the volume of water that was expected to flow in the area. Table 8 shows the length in meters of each pipe size (in diameters) that were to be employed in the waterworks project. See Appendix, Chapter 5, B for the distribution per suburb.

Pipeline Size (Diameter of pipes in meters)	**Total length in meters that constituted the waterworks system (approved Palacios plan)**	**Total length in meters that constituted the waterworks system (actual lay out)**
0. 65	1, 170	1, 175
0. 55	870	1, 050
0. 46	640	495
0. 40	770	880
0. 34	2, 224	2, 315
0. 30	2, 420	2, 410
0. 25	1, 700	1, 605
0. 22	1, 165	1, 125
0. 20	3, 271	3, 185
0. 16	4, 160	3, 130
0. 12	6, 380	7, 835
0. 08	1, 155	3, 100
Total	**25, 925**	**28, 305**

Table 8: Total length of pipes, of different measurements, that traversed Manila and its suburbs in the city´s waterworks project
Source: AHN, Ultramar, 491, Exp. 4.

[76] Ibid.

After several reviews and ground inspections, some sizes of pipelines needed to be modified from the approved plan to the actual layout due to the changing needs of the city. For instance, the pipeline that would be positioned in Carriedo Street in Quiapo were originally smaller in dimension at 0.46 cms. in diameter. Recognizing the vitality of the street and the existing conditions of the said thoroughfare, Palacios and the board of engineers agreed to place bigger pipes for Carriedo Street thus reflecting the increase in the pipelines that measured 0.55 cms. in diameter. Meanwhile, smaller pipelines of 0.08 dimension increased considerably in the 1875 proposal of Palacios as new distribution lines, however minor and insufficient, were added in the capital such as in the suburbs of Tondo, Sampaloc, and San Miguel (Uli-uli Road). Palacios himself recognized that the smallest pipes were chosen due to the limited budget for the purchase of bigger water conduits.[77] In summary, the total length of pipes that traversed the city reached at 28,305 meters or more than 23 kilometers of water distribution lines. To give us an idea to its extent, we can just imagine that the distance from Sampaloc, where the principal distribution line began, to Binondo and Intramuros was at three and six kilometers respectively. Meanwhile, Tondo which was at the extreme suburb on the right side of the river bank was around six kilometers far from the suburb of Paco on the southest east side of the city across the Pasig river. In time, this 23-kilometer distribution pipeline would prove to be deficient for the provisioning of a capital that was growing with more or less 250,00-300,000 inhabitants.

For water to be finally consumed by the urban residents of Manila, the distribution lines were dotted with hydrants or fountains in the different parts of the city. Two types of hydrants were put in place. The first type consisted of fountains where potable water flowed. The second type comprised the fire hydrants allocated for fires and street cleaning (*boca de riego, boca de incendio*). The water hydrants were to be built of smelted iron and not in stone. There were three types of potable water fountains. In some areas of the capital, the public fountain had only one faucet. Some had two valves while others had four water openings.[78]

On paper, the water fountains were planned to be constructed within the municipal radio at intervals of 100 meters and in greater distances in some parts of the Manila suburbs. Ideally, the number of water fountains and the type to be placed inside Intramuros and in each and every suburb should depend on the number of inhabitants. Official reports, such as the one written by

[77] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, No. 7 Proyecto de conducción y distribución de aguas de Manila según dispone la Real Orden de 10 de junio de 1875. Memoria sobre los presupuestos de construcción de las obras que pueden hacerse por administración y por contrata.

[78] AHN, Ultramar, 492, Exp. 2, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Presupuestos de gastos. Modificaciones del trazado de las tuberías, (1881-1886).

Mas y Otzet in 1882, indicated that there were around 390 fountains for potable water and 280 fire hydrants that were put in place.[79] These numbers provided by the official chronicler of the inauguration of the waterworks system in 1882 were interesting because the blueprint authored by Palacios in 1879 revealed only half of this number which was at around 200 public water fountains.[80]

The laying down of pipe waters in the capital proved to be challenging due to the very low elevation of some of the streets and points of the different suburbs and the numerous estuaries that had to be crossed by the pipes.[81] Eventually, the insufficiency of public water fountains caused the inadequate and unequal water distribution for the capital´s increasing number of residents and resulted to the inhabitant´s vulnerability especially in times of epidemics.

Technological transfers and hybridity

Due to the project´s magnitude in terms of scale and budget, the 1875 approval of the Manila waterworks indicated that the project be divided into different parts that could be undertaken through public contracts and bids or through administrative execution. As previously mentioned, Palacios´ conveniently divided the massive project into two parts: first, the water conduction phase and second, the water distribution phase.[82] According to Palacios, the conduction phase was the more difficult segment of the plan which composed of the constructed of mines and tunnels and the water reservoir (*el depósito*). The two phases consisted of several contracts for the construction and elaboration of specific parts of the plan (e.g. land and excavation works; masonry works; construction of aqueducts, bridges, siphons; placement of pipelines, etc.) to the acquisition and operation of new machines and equipment and more up-to-date building materials and pipes necessary for the waterworks system project.

[79] Mas y Otzet, (1882), p. 76.
[80] AHN, Ultramar, MPD. 4634, Proyecto de conducción de aguas a Manila: Variación de algunos diámetros de tuberías de la distribución: Plano de las líneas de tuberías de la distribución de aguas potables en Manila y sus arrabales, según el trazado aprobado por R. O. de 10 de junio de 1875, indicando las longitudes y diámetros de las tuberías, la situación de fuentes y llaves de comunicación y de desagüe, Manila, 20 agosto 1879.
[81] Palacios, tomo I, 14 (1878), p. 166.
[82] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, No. 7 Proyecto de conducción y distribución de aguas de Manila según dispone la Real Orden de 10 de junio de 1875. Memoria sobre los presupuestos de construcción de las obras que pueden hacerse por administración y por contrata.

These public biddings became spaces for participation of the different social groups in and outside the colony- from mestizo and Chinese contractors to Spanish and European construction and technological companies as well as Asian-based foreign manufacturers. Spanish and non-Spanish construction houses and companies that were based in the Philippines and Europe could participate in these biddings. The biddings in the public works projects supervised by the IGOP demonstrated open participation of different players in the field of science and technology. Generally, the plans and blueprints of the waterworks project authored by Palacios exposed a heavy reliance on Western most especially British, French, and Belgian science and technology complemented with local knowledge, materials, and workforce.

One of the biggest and most expensive biddings in the waterworks project was the acquisition of the pumping machines in 1881. The engines would drive water from the river source to the pipes leading to the water reservoir and the distribution lines towards the colonial capital.[83] José Echeverria, a Paris-based engineer, authorized by the Ministry of Ultramar to serve as a commissioned agent for the procurement of machines, materials, and services through public biddings accepted proposals from French and Belgian construction houses and companies that wanted to participate in the bidding process. The proposals of these construction houses consistrd of supplying pumping machines of 25 feet in height and that can pump 160 liters per second. Echeverria, because of his formation as an engineer, not only served as a facilitator in the bidding process but also provided some technical assessment on the proposals. The table below, for example, lists the French and Belgian manufacturers that expressed their interest in supplying the pumping machines for the Manila waterworks project. It also shows the concerns raised by the engineers of the IGOP concerning the technical specifications of the pumping machines according to its steam engine, the primary pump of the machine, the auxiliary pump, the steam generator, the machine´s weight, and it´s bulk weight once transported by sea.

[83] AHN, Ultramar, 491, Exp. 3, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto de conducción y distribución de aguas empleando máquinas, 1871-1874.

Name and Location of Construction House/Manufacturer	Several Technical Observations Made by the Engineers of IGOP
Carels Brothers (Ghent, Belgium)	The engines and pumps seem complicated, and their mechanisms are too fragile for the conditions of Manila. The number of machines and their mechanical designs is too risky; there is a high risk of dislocation of several important machine parts especially in times of earth tremors because the mounting frames of the machines are overly stretched and there is too much rigidity in the entire machine system.
Crozet and Company, (Le Chambon-Feugerolles, France)	The proposal offers a complete but with less sophisticated machines. Its large dimensions and the heavyweight and overly stretched mounting of the machine´s frames can produce dislocations and breaks in times of movements of the ground.
Limited Company of Mechanic Constructions of Anzin (Anzin, France)	The principal defect of the proposed machine consists of the oversized and bulky frames of the motors and the pumps. Withstanding Manila´s condition and the constant fear of earthquakes as well as the very high suction height, this proposal would be without a doubt one of the best.
Henri Satre and Company (Lyon, France)	The general design and layout of the proposal is simple, good, and less costly. It, however, has no auxiliary pumps.
Jose Fazcot and Company (Saint-Ouen, France)	Apart from the excessive rigidity of the entire system and the complex configuration of the system, the proposal is good but of a very high cost.
Cail and Company (Paris, France)	The proposal has good qualities and advantages. The machine parts are well configured, the pumps are of simple and robust construction, and fulfill all conditions of safety and proper functioning.
Crozet and Company and Prumier (Le Chambon-Feugerolles, France)	The proposal differs from all the rest of the designs and offers the best way to pump water especially in the distinct case of Manila. The machines are easy to install, the manufacturers provide time to test run the machines, and the type and weight of the devices are ideal.
Locoge and Company (Lille, France)	The type of pump that the proposal offers is not appropriate.

Table 9: Summary of different proposals for the acquisition of pumping machines for the waterworks system
Source: Costelo, 2020. Elaborated from the data collected in AHN, Ultramar, 491, Exp. 3.

Moreover, the public bidding for the pumping machine was opened for other manufacturers. Manila-based agents played an important role for other players to participate in this process. It is in this context that Frederic Sawyer, engineer-agent, and representative of the English manufacturer Mirlees Fait and Walon in Glasgow, could present a proposal of supplying pumping machines for the waterworks project that were capable of elevating 103

liters of water per second.[84] The presence of agents in the archipelago that facilitated the acquisition of new machines and emerging technologies in Europe, in this case, proved advantageous. Although the French and Belgian proposals offered machines with a capacity of pumping 160 liters per second, in the end, the colonial government opted for the English proposal for the following reasons: first, the English machine and its installation was examined to be way cheaper than the rest of the designs; second, the quality of the pumps have passed the inspection; third, the mode of payment fits the limitations of the waterworks projects; fourth, tests can be done in Manila to verify the machine´s performance and durability, and lastly, the manufacturer offered the replacement of damaged parts of the machines.[85]

The coal that was used to run the machines of the waterworks system was also imported through contractors. However at first, Palacios thought that coal from the island of Cebu could actually be used in the construction work. Even though the engineer recognized that the quality of Cebu coal was inferior compared to the imported one (*carbon inglés*), he said that the government could save a significant amount of money from the former.[86] Unfortunately, the mines in Cebu did not produce the desire results and the project proceeded with relying on imported carbon.

In the Manila waterworks plan, many Chinese middlemen served as contractors in the waterworks project, mostly involving the supply of raw construction materials, such as carbon. An example was the Chinese named Co-Fimco, a resident of Binondo who won a public bid on 1 June 1887. Co-Fimco was contracted to supply 200 tons of carbon from Australia for the operation of the pump machines used to elevate water from the river to the water pipes.[87] The purchasing of fire hydrants to be installed in the water lines was also made through private contractors. Manila-based foreign contractors Enrique Wilks and Herrman Schwenger, for example, were approved to supply 100 and 117 fire hydrants respectively.[88]

Natives and Chinese provided the hard manpower for the waterworks project. They served as the foremen (*capatazes*), the clerks (*escribientes*), stone cutters or quarrymen (*pedreros*), laborers (*peones*), carpenters (*anloagues*) and stonemasons (*canteros*) of the

[84] AHN, Ultramar, 492, Exp. 2, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Presupuestos de gastos. Modificaciones del trazado de las tuberías, 1881-1886, Carta del Gobernador General, Manila, 29 April 1881.
[85] AHN, Ultramar, 491, Exp.3, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto de conducción y distribución de aguas empleando máquinas, 1871-1874.
[86] Ibid.
[87] AF-BTNT-CCHS-CSIC, Abastecimiento de agua, Microfilm Roll, 1767, Concesión a la contratista chino Co-Finco¨, Manila, 1 de junio de 1887.
[88] AF-BTNT-CCHS-CSIC, Abastecimiento de agua, Microfilm Roll, 1764, Concesión a las contratistas Enrique Wilks y Herrman Schwenger¨, Manila, 24 de marzo de 1887.

construction job. The table below is a list of the personnel that constituted the pumping station project in Santolan and their corresponding salaries. For this service, the machine specialists were oftentimes mechanical engineers or foreigners with technical expertise in the operation of engines. The rest of the positions were already occupied by the mestizos and natives.

Personnel in the Pumping Station in Santolan	**Salary in pesos**
One first-class machine specialist (workshop master)	3, 000
One second-class machine specialist	1, 000
One third-class machine specialist	600
Four assistant machine specialist	1, 440 (at 360 each)
Eight boilermen (*fogoneros*)	1, 920 (at 240 each)
Eight frontman (*capataces* o *paleros*)	1, 152 (at 144 each)
One iron filer (*linador*)	360
One blacksmith (*herrero*)	360
One clerk (*escribiente*)	240
One guard (*machacante*)	120
One workshop labourer (*peon de taller*)	120
One administrative assistant (*ordenanza*)	120
Table 10: Personnel in the Santolan pumping station and their corresponding salary *Source:* AHN, Ultramar, 492, Exp.2	

During the construction phase of the waterworks project, long lists of workers that were employed in the waterworks project were reported monthly. The records revealed the names of thousands of laborers, their age (if they are under-age or already of age), the number of days and the amount that had paid them in exchange for their service.[89] During the planning phase, it was debated if forced labor would be utilized in this public works project. Inspector General Ramírez Bazan remarked that aside from manpower from corvée, paid labourers should be contracted for the construction work. While the men rendering forced service could perform general tasks, the waterworks required a constant pool of skilled workers from paid, experienced construction labouerers. The engineer said that this was essential for an orderly, organized, and actually more economical implementation of the project since, most of the time, labour from corvée was inconsistent and of poor quality.[90]

[89] AF-BTNT-CCHS-CSIC, Abastecimiento de agua, Microfilm Roll, 1770, Lista de los trabajadores de la traída de aguas de Manila.
[90] AHN, Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, 1874-1876, Carta de Manuel Ramírez Bazan, 15 de septiembre de 1874.

Meanwhile, local and indigenous materials were utilized in the waterworks project such as lime and limestone from Binangonan and San Mateo, stone and gravel from Bulacan, brick from Manila, *molave* wood from Pampanga and other nearby provinces.[91]

D. Controlled and Contested Waters

On 3 August 1866, a landmark law was passed in Spain that marked its first water code. Called the *Ley de Aguas,* it assembled, regulated, and established an entire system of classification, utilization, distribution, and management of water. A reflection and a product of the nineteenth-century liberal tradition, the law defined what constituted public and private water and laid out rules on water exploitation. Water use was generally categorized to supply drinking water and for agricultural, navigational, and industrial purposes. The great societal transformations of the nineteenth century, largely characterized by urbanization, industrialization, and heightened demand for more resources, signaled the need to lay out mechanisms to establish adequate distribution flow for these diverse needs. Moreover, these mechanisms also included the rules on how to modify the natural course of waterways and the necessity to reconcile the different forms of water exploitation considering the supply limitations. [92]

While it is true that several laws concerning water were already passed in the earlier years in the metropolis, the 1866 law was distinct because its validity was extended in the administration of the colonies such as the Philippines. As a result, the law would serve as guide in matters related to water use in the islands. Contemporaneous to the creation of the 1866 *Ley de Aguas* was the foundation of the IGOP in the Philippines. This institution composed of engineers was tasked to study, assess, and supervise all hydraulic projects that would be carried out in the colony.

Surveillance and regulating water use

Controlling the flow of water implies controlling the city and its inhabitants. Water access and distribution became a form of social control in the colony. In the case of Manila,

[91] AHN, Ultramar, 491, Exp. 1, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Extracto del expediente, 1859-1886.
[92] Sebastian Martin-Retortillo, ¨La Elaboración de la Ley de Aguas de 1866,¨ *Revista de Administración Pública,* número 032 (2014), p. 14.

new modes of social regulation and discipline were put in place based on the evolving idea of clean, safe, and modern drinkable water. The colonial government implemented laws and rules that exacted control among the water activities of Manila residents most especially of the natives.

The authorities implemented increased surveillance near the areas of an Mateo River, the source of Manila´s water, to ensure that the conduct of water from the source to pipelines would remain uncontaminated and unobstructed. The *Guardia Civil Veterana* was assigned to patrol along water sources to monitor and restrict the movement of the natives. During the late nineteenth century, reports of swelling communities in the elevated areas of San Mateo, Binangonan, and Marikina threatened the quality of water as more people used the waterway for all their water needs. The colonial authorities determined activities related to water that were criminalized such as washing of dirty clothes of sick people and bathing near the water source. Individuals caught throwing things from sick or dead people and excreting human waste in the river were severely penalized.[93] To further implement this control, the colonial government adopted a more rigorous surveillance system. In July 1888, it issued a decree employing the necessary force of the urban and rural police to perform household surveillance with reported cases of illnesses and their habits related to water. It also stated the assigning of four more leaders (*cuadrilleros*) per barrio that were specifically tasked to monitor the water activities of the inhabitants such as where and how they get water and how they throw their waste.[94]

State control was not only limited to activities near the water source but more importantly, was extended to the water lines and water distribution. In public spaces, the colonial government imposed closer vigilance and stricter protection on the pipelines. In the case of Manila and its suburbs, the colonial government employed the services of plumbers (*fontaneros*) and overseers for the sole purpose of guarding and monitoring the state of the water lines, water pipes, and public water fountains. Their original duty was to manage and maintain the excellent condition of the water lines and pipes, and if needed, repair them also. The repeated incidents of prohibited extraction of water from the public fountains and the destruction of some water lines prompted Inspector General Ramírez Bazan of the IGOP to ask the Ayuntamiento de Manila to employ more plumbers and overseers. Their tasks included the surveillance of the public water fountains, the inspection of water lines and pipes leading to private houses and buildings, and monitor the resident´s activities surrounding the water

[93] AF-BTNT-CCHS-CSIC, Abastecimiento de agua, Microfilm Roll, 1767, Informe de Manuel Ramírez Bazán al Ayuntamiento de Manila, Manila, 20 de abril de 1886.
[94] Ibid.

fountains and water sources.[95] Most of the time, these plumbers and overseers ended up fighting with the residents while they tried to implement the rules of the colonial government to control water use. Usually, these rules contrasted with the residents´ views and habits regarding water and its use. On 31 May 1894, the captain of the Fire Brigade of Manila reported that a day earlier while he was inspecting the flooded streets at around 7:30 and 8:00 in the morning, a serious altercation occurred between a Chinese man and a plumber named Ramon de Leon in Paseo de Magallanes. According to the official report, the Chinese was illegally extracting water, and when asked to pay the dues for water service, he violently refused to oblige. It became a severe fight that it disrupted public order and produced commotion in the thoroughfares.[96]

On the other hand, there were also reported cases of suspended plumbers and overseers for failure to comply with their duties and for getting involved in instances of abuse. For instance, in four different reports, Juan José Hervas, municipal architect and director of the works for the distribution of water in Manila, communicated the names of plumbers and overseers who were suspended for several days for the months of October and November in the year 1895.[97]

Name	Occupation	Number of Days of Suspension
Juan Aquino	plumber	10 days of suspension
Geronimo Guansing	plumber	6 days of suspension
Esteban Pineda	plumber	6 days of suspension
Joaquin Justiniano	plumber	2 days of suspension
Prudencio de Leon	plumber	2 days of suspension
Estevan Baldonado	plumber	10 days of suspension
Agustin Ramires	overseer	8 days of suspension
Mariano Jimenez	overseer	20 days of suspension

Table 11: Select documented cases of suspended water plumbers and overseers
Source: Costelo, 2020. Elaborated from the data collected in AF-BTNT-CCHS-CSIC, Abastecimiento de agua, Microfilm Roll 1790

These reports however only provided a general cause and did not provide a detailed account of the reason for suspension. Nevertheless, the plumbers and the overseers became the face and personified representation of the colonial government´s mechanisms of water control.

[95] Ibid.
[96] AF-BTNT-CCHS-CSIC, Abastecimiento de agua, Microfilm Roll, 1769, ¨Informe de Jose Irastro al Corregimiento of Manila, 31 de marzo de 1894.
[97] AF-BTNT-CCHS-CSIC, Abastecimiento de agua, Microfilm Roll, 1790, Informes de Juan José Hervas al Corregimiento de Manila, 21 de octubre de 1895, 22 de octubre de 1895, 28 de noviembre de 1895, 30 de noviembre de 1895.

It was not surprising therefore that they experienced firsthand the many forms of resistance of the residents to evade the apparatuses of state regulation.

Controlling water also implied the regulation of its use. Aside from drinking and domestic use, two other themes caught the attention and policy direction of the colonial authorities concerning water. One of these was the problem of great urban fires, one of the man-made disasters that constantly and severely affected Manila. As already discussed in the previous chapters, the authorities perceived that the house building technique employed by the natives aggravated the persistence of conflagrations in the capital. Combustible light materials such as nipa, cogon, bamboo, and wood characterized these dwellings. With the heightened urbanization and agglomeration of houses in the suburbs, one small flame could transform barrios and suburbs into ashes in just a few hours such as the San Nicolas fires on 30 April and 2 May 1863 and the Tondo fire in May 1865. As discussed in Chapter 1, the burning of these districts was exacerbated by the narrow and tortuous alleyways and obstructed esteros that could have been the source of water to stamp out the fires.

One of the interesting components of Manila´s hydraulics system was the inclusion of fire hydrants in the waterworks network. Not only was drinking water supplied through the water supply system, water was also provided to help quell city flames. Mas y Otzet documented that there were around 280 fire hydrants by 1882.[98] According to Bruce Hensler, the presence of fire hydrants along with increased capacity, larger reservoirs, and grid distribution system characterized the significant improvement in the public water supply infrastructure.[99] During the planning stage, the municipal authorities consistently mentioned that the water infrastructure could be one of the solutions to the incessant fire problems of the city together with the zoning and building regulations on the construction of houses of strong materials vis-à-vis the light ones.[100]

Hensler added that organizing specialized firefighting institutions was a nineteenth-century feature of modern European cities.[101] In Manila, the creation of a specialized organization of the same purpose first occurred in the years 1878 to 1879 with the establishment

[98] Mas y Otzet (1882), p. 76.
[99] Bruce Hensler, *Crucible of Fire, Nineteenth-Century Urban Fires and the Making of the Modern Fire Service* (Washington, D.C.: Potomac Books, 2011), p. 9.
[100] See Huetz de Lemps, (1998a).
[101] Hensler, (2011), p. 104. London created its Metropolitan Fire Brigade in 1866. In Madrid, firefighter groups called *mangueros* were already existent in the second half and last quarter of the nineteenth century. For instance, there was a group dedicated exclusively to fighting fires in theatres. However, it was in 1894 that an organized professional firefighting institution was created in the metropolis which became the forerunner of the *Cuerpo de Bomberos.* See: Angel Díaz Caro, *Diseño arquitectónico y protección en caso de incendio: Desarrollo normativo español en materia de evacuación en los siglos XIX y XX,* Dissertation, Universidad Politécnica de Madrid, 2015.

of Manila´s first Fire Brigade (*Cuerpo de Peones Bomberos de Manila)*.[102] During this time different technologies were considered by the authorities to address the fire problems in the city. For instance, a fire-extinguishing apparatus called ¨mata fuego¨ invented by Ramon Bañolas was brought into the capital.[103] With the installation of fire hydrants, more technologies were presented to the firefighters. American author Salt wrote in 1913 that the effectiveness of the hydrants and the responsiveness of the brigade were perceived after fires in the *nipa* communities of Paco and Tondo in January and February 1885.[104]

The three fires that occurred on the same day on 18 January 1885 was perhaps the most documented account on how the combined forces of the *Dirección de la traída de aguas, Cuerpo de bomberos,* local leaders, and native residents gathered together to suppress a suburb-wide fire that could have had converted the entire Tondo into ashes just like in 1865. The various eyewitness accounts all stated that the suppression of the urban conflagration was made possible due to the hosepipes that were connected to the different fire hydrants in the district.[105] At 1:00 o´clock in the afternoon on the aforementioned day, a fire broke out in one of the *nipa* houses in a *sitio* called Guitna. Don Lamberto Avellana, one of the city´s water inspector (*celador-sobrestante*), whose house was located near the site responded quickly and used the hosepipes and other devices that were in his possession. With the help of some native firemen and other labourers (*peon bombero y capatazes*), Timoteo Trinidad, Eustaquio Lazaro and Pedro Certeza, they connected the hose to the fire hydrant located in Tranvía Street which was 100 meters away from the source of the fire. Pointing the hose in the opposite direction of the wind, they started stamping out the fire in the barrio. Along with the other native residents and the parish priest Fr. Salvador Font, they were able to extinguish the fire.

Yet, another bigger fire broke out the same afternoon in Ilaya Street. Using the devices that they used in Guitna, they connected the hosepipes to one of the fire hydrants located in Calle Huertas. Soon enough, foremen led by Francisco Adarna and other natives arrived in the area with fire-extinguishing apparatus from Arroceros. Soon after, firemen Potenciano Aquino y Segundo de Guia came with additional hosepipes from the suburb of San Fernando de Dilao.[106] With the latter, more water was pumped from a fire hydrant in the street near the

[102] AHN, Ultramar, 5236, Exp. 15, Creado Cuerpo de Peones Bomberos para Manila, 1878-1879.
[103] AHN, Ultramar 508, Expediente 5, El Gobierno Superior Civil de Filipinas solicita los datos necesarios para conocer el aparato ideado por el Sr. Bañolas para la extinción de incendios, 1873.
[104] Salt (1913), p. 204. Salt also mentioned that apart from this corps, a special group called Plumbers Brigade (*Cuerpo de Fontaneros)* was also created during this period.
[105] AF-BTNT-CCHS-CSIC, Abastecimiento de Aguas, Microfilm Roll 1791, Testimonios de Don Lamberto Avellana, Potenciano Aquino y Segundo de Guia sobre el incendio del 13 de enero de 1885.
[106] These accounts are remarkable since Arroceros and San Fernando de Dilao/Paco were in the other side of the Pasig river. No account was given why the response did not immediately come from the adjacent Binondo.

Tribunal de Naturales. According to the accounts, the combined forces of the three pumps and solidarity of the natives prevented the fire from burning the other *nipa* houses, the butcher shop in the area, and the *Tribunal de Naturales.*

In the adjacent street of Ilaya, flames also started. The hosepipes were connected in a hydrant located near the house of a certain Don José Lerma behind the barracks of the *Guardia Civil Veterana.* The reports insisted that while indeed houses were burned, the response during that day prevented the effects that could have been extraordinarily great in proportion. While contiguous houses and structures were burned down, they emphasized that they were able to prevent the spread of the flames on the parallel streets. Supposedly, the 13 February 1885 reports included plans on the spread of the fire, the structures and houses that were affected, and the location of the fire hydrants that were used. Unfortunately, these plans were no longer extant and only the testimonial accounts remained. As a reply, the Ayuntamiento de Manila in a session in February 1885 commended the response of the aforementioned individuals and the communities and gave more authority to the local leaders of the districts to utilize the hydrants in circumstances as they see fit.[107]

The increasing industrialization of the city and its nearby territories also signified the growing demand for water to propel the different industries and productions in the capital. For instance, the Manila-based trading house Smith Bell and Company, reported its increasing need for water to run its sugar productions in Manila and the nearby areas. The intensified regulatory arm of the government was manifested when the said company asked for a water concession in Tuliajan river. Although the river did not directly traverse the capital´s territory, it remained to be one of the water sources especially of the communities to the north of the city such as Tondo.

On 17 July 1883, the Luzon Sugar Refining Company under the Bell Smith Company applied for the concession of the exploitation of water in Tuliahan river.[108] The petition was for the operation of a sugar refining factory in Malabon so the company could expand its operations and produce white sugar not only for the consumption in the capital but also for exportation to the peninsula. According to its application, the company´s desire to invest in the capital could be shown in its acquisition and establishment of an industrialized refinery using filtration machines. In order to achieve the desired sugar production, sufficient water supply was necessary to wash the filtrating materials and other industrial processes.

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[107] AF-BTNT-CCHS-CSIC, Abastecimiento de Aguas, Microfilm Roll 1791, Carta de Barrantes al Ingeniero director de las obras de abastecimiento de aguas potables, 13 de febrero de 1885.

[108] AHN, Ultramar, 490, Exp. 18, Concesión del aprovechamiento del agua del río Tuliajan, Propuesta de la Sociedad Anónima Luzon Sugar Refining Company, 17 de julio de 1883.

According to the proposed plan by the British engineer Frederic Sawyer, the company sought for the daily extraction of 320 cubic meters of waters or an equivalent of 3.70 liters of water per second through steam-powered machine pumps. The pumps would be located under the Tuliajan bridge. Water would then be conducted to the pipes leading to the *Hacienda de Malinta* owned by the Augustinian order, and would traverse the public roads and private lands. This petition was something new for the authorities because of the industrial character of the water concession and the unclear regulations concerning this nature in the *Ley de aguas of 1866.* Manila-based and Madrid-based engineers gave reports and reviews on the proposal. The Manila-based engineers of IGOP recommended its approval citing that the river could hold the volume of water exploitation since according to their technical study, the river´s lowest level recorded a supply of 261 liters per second. On 15 March 1884, the colonial government approved the petition but reminded that several measures should be observed in the laying out of pipelines to prevent obstacles in the use of the lands in the area, the circulation of roads, and the navigation of the esteros. It also prescribed the establishment of a nozzle at the highest point of the conduction pipe to serve as regulator so that only the approved amount of water be derived from the river.[109]

Distributing the piped water

The regulations set by the colonial government for the public use of water indicated that the drinking liquid extracted from the public fountains was free of charge.[110] During the early planning phase of the water infrastructure, the Manila city council formed a commission on 21 November 1872, that would undertake an economic study on the waterworks project plan. The commission was composed by *segundo alcalde* Vicente Aviles and councilor José Vicente Velasco. One of the important recommendations of the commission was their insistence that the service be free for public use responding to some authorities who were already exploring the idea that residents be compelled to pay for public water access. The two city council members expressed that this provision would greatly alleviate the underprivileged class of Manila who were suffering severely from buying expensive water. This water was usually sold by Chinese and native *aguadores* who collected water from the upper stream of the Pasig river or from the nearby natural springs. Since most of the poor urban residents could not afford this

[109] AHN, Ultramar, 490, Exp. 18, Concesión del aprovechamiento del agua del río Tuliajan, 15 de marzo de 1884.
[110] *Reglamento para el uso público, gratuito y a domicilio privado mediante retribución de las aguas potables del canal de Carriedo* (Manila, Imprenta de la R. Mercantil de Díaz Puertas y C. Cervantes, 1885).

supply, they then resorted to the contaminated Pasig river and esteros for all their water needs-from bathing, washing, cleaning, cooking, and drinking. The commission remarked that this was one of the reasons of the residents´ illnesses, the outbreak of diseases, and thus the worsening of public health. They also added that free water should be serviced in Manila since in Spain this has been the observed and practiced philosophy in terms of water provisioning. In the commission´s words: ¨The Administration cannot consider less that Spain has always considered, both in the Peninsula and the Ultramar provinces, that the water fountains be numerous and be free of use¨ (¨*La administración no puede menos de considerar la cuestión que España ha considerado siempre tanto en la Península como en las provincias ultramarinas el decir que las fuentes sean numerosas de uso público y gratuito).* However, they recommended that payment be required for the water supply of sea vessels and ships, water consumption in residencies, and domicile service.[111] Indeed, water from public fountains was free when Manila inaugurated its waterworks in 1882, a fulfilment of Carriedo´s will and legacy.

However, the colonial government imposed many mechanisms of control concerning public water extraction and use. Regulating water consumption in the public fountains was crucial for the authorities due to the limited and calculated daily water supply that was pumped from the San Mateo river to the *El Depósito* water reservoir and conducted to the pipelines of Manila´s different districts. The colonial government´s perception that the natives and the Chinese had the natural tendency to dissipate and excessively consume water was reflective in the different policies concerning public fountains´ use. According to the regulations, residents were only allowed to gather water from the fountains through proper water vessels wide enough so that no liquid would be put to waste. It was strictly prohibited to install water hose from the public faucet to conduct water to any storage, receptacles, and boats. The authorities cited that one of the typical water abuse practices was the urban residents´ canalization of fountain water to directly reach their homes and private dwellings. Therefore, prohibitive fines were imposed to those residents who were found guilty of illegally extracting water from these public sources.[112] To implement these regulations, the municipal government had to intensify its vigilance mechanism by employing water inspectors or *celadores de agua* apart from the

[111] Ultramar, 491, Exp. 4, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Proyecto reformado según las prescripciones dispuestas en 1875, 1874-1876. Informe del *segundo alcalde* Vicente Avilés y regidor José Vicente Velasco.

[112] *Reglamento para el uso público, gratuito y a domicilio privado mediante retribución de las aguas potables del canal de Carriedo* (Manila, Imprenta de la R. Mercantil de Díaz Puertas y C. Cervantes, 1885).

policing activities of the *Guardia Civil Veterana.* In April 1886, for example, unauthorized extraction of water from public fountains was related to the municipal authorities of Manila when residents of Pandacan, a town northeast of the capital, were found to be unlawfully conducting water from the public fountains in the nearby suburb of San Miguel and Uli-uli. During this time, Pandacan had no access to public water since the pipelines did not reach the area. Until the late nineteenth century, the pueblo was a frontier of the colonial capital so it did not belong to the priority areas where the tubes and water lines passed through. This Pandacan incident compelled the urban police to heighten their surveillance operations in the area. However, these incidents became normal occurrences as urban residents desperately needed fresh and safe water. As a consequence, these cases compelled the municipal government for the urgent acquisition of mechanical water meters that were installed to the fountains. The engineers believed that this technological device was the best solution to regulate the water flow in the public fountains. [113] In short, the Manila waterworks service was a free but a highly regulated urban facility.

Controlling water distribution could be best seen in the pipeline distribution and reach of the Manila waterworks. In terms of circulation and supply, peripheral areas had no sufficient access or had no access at all to new technology services like potable water because naturally the more lucrative spaces at the center were the privileged spaces.[114] Graham and Marvin argued that in colonial cities the waterworks network was largely concentrated to meet the needs of metropolitan and local elites.[115] In the Manila hydraulics system, we can test and examine the access to water supply by using as reference the Palacios blueprint on the distribution of water lines in the capital. Figure 7 is a reconstruction of the pipelines plan that ran from the principal water pipes in Sampaloc down to the various suburbs on the right bank of the river. The lines were made to cross the Pasig river to reach Intramuros and the three districts on the left bank.

[113] AF-BTNT-CCHS-CSIC, Abastecimiento de Aguas, Microfilm Roll 1767, Informe de Manuel Ramírez Bazán al Ayuntamiento de Manila¨, 20 de abril de 1886.
[114] Stephen Graham and Marvin Simon, *Splintering Urbanism Networked Infrastructures, Technological Mobilities and the Urban Condition*, London and New York, Routledge, 2000, p. 59.
[115] Ibid., p. 82

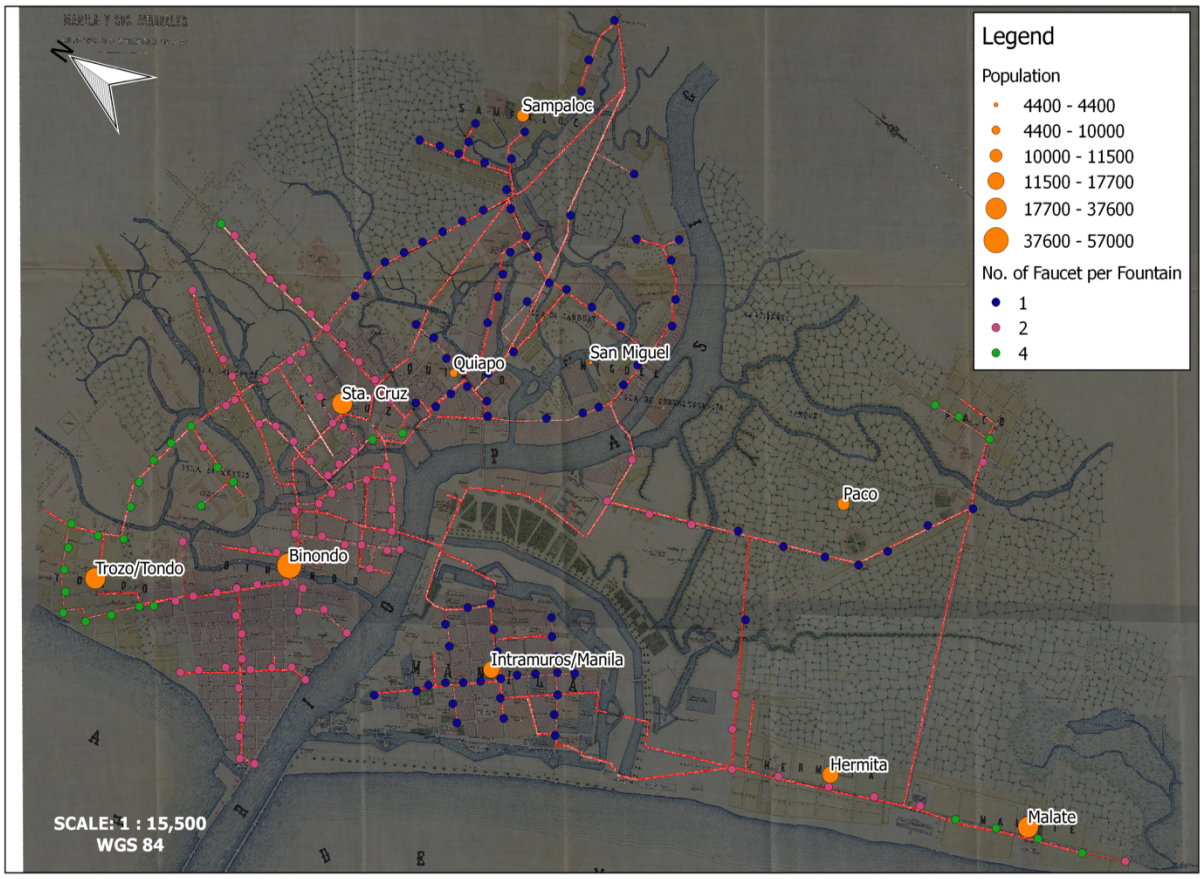


Figure 7. Map showing the water lines that ran through Manila and its suburbs
Source: Costelo, 2020. Elaborated from the data collected in AHN, Ultramar, 491, Exp. 1, 2, 3 and 4; and Ultramar, 492, Exp. 2

In an instant, this figure demonstrates the emergence of a networked city connected by water channels. The pipes, similar to the streets and the street lights in the previous chapter, was a technological device that provided another layer of interconnection that literally linked the growing Manila urban sprawl. In a way, these conduits determined and reinforced either the integration or isolation of urban communities in the capital. The areas that were reached by the pipelines became more interspersed while those that were not were one step behind towards development.

However, the figure also demonstrates the prioritization and privileging of water circulation in the city. The districts and streets where pipelines traversed were the areas classified as important spaces that needed and deserved primary water access. From this figure, we can say that the pipelines reached all the districts in Manila. However, not all districts nor the two sides of the river bank had an equal number of water conduits. The glaring contrast could be first observed between the suburbs on the right of the riverbank composed of Binondo, Sta. Cruz, Quiapo, San Miguel, Sampaloc and Tondo vis-à-vis the districts of San Fernando de

Dilao or Paco, Hermita, and Malate located to the left of the Pasig river. While many parallel and intersecting water channels navigated through the suburbs on the first geographical area, only singular lines existed on the other. Intramuros, of course, was a different case. Even if it belonged to the second geographical category, its political and religious significance for the colonial city was what spelled the difference. Meanwhile, this inequality could also be observed in the different suburbs on the right side of the Pasig river by looking at the concentration of pipelines in the zone. Here, we can see that more pipe networks were placed in the suburbs of Binondo, Santa Cruz, and Quiapo compared to the suburbs of Tondo, Sampaloc, and the barrio of San Nicolas.

Figure 8 further enriches this analysis by incorporating the plans for the public water fountains to the pipeline network of the Manila waterworks. In this figure, we emphasized the number of water fountains installed in every pipeline, the specific location of each public fountain and the type of hydrants that were installed in these water sources. Palacios and the techno-scientific team behind the project agreed of placing three types of fountain: one-valve hydrant, two-valve hydrants, and four-valve hydrants. These distinctions were shown in Figure 3 by designating distinct color for each type of hydrant.

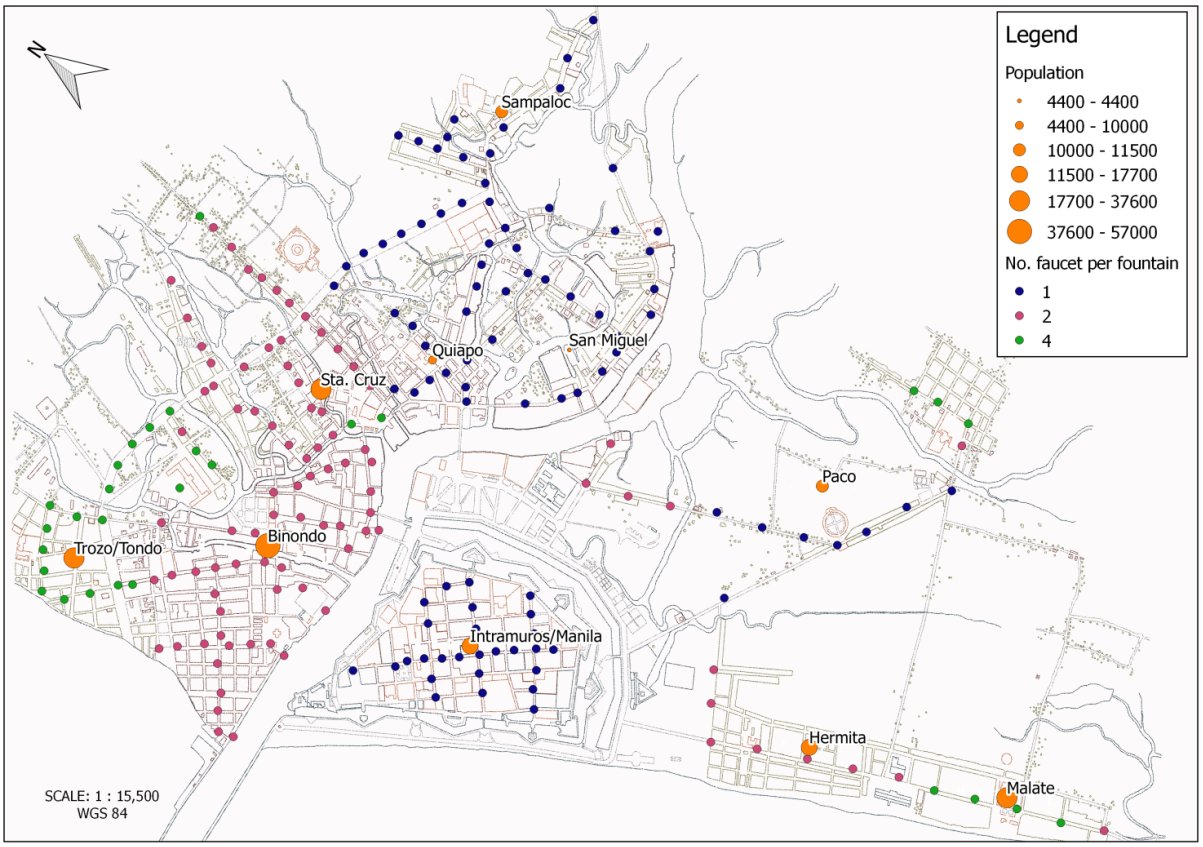


Figure 8: Map emphasizing the water fountains distributed in the different suburbs
Source: Costelo, 2020. Elaborated from the data collected in AHN, Ultramar, 491, Exp. 1, 2, 3 and 4; and Ultramar, 492, Exp. 2

The location and position of the public fountains would be more meaningful if we could identify the streets and suburbs to which they comprised. Of our knowledge, there was no published nineteenth-century map that specifically delineated the borders of each suburb. Utilizing the map reconstructions in Manila in Chapter 1 of this investigation, we were able to identify, mark, plot, and delineate these water structures as shown in Figure 8. Again, this figure evidently shows that Intramuros and the suburbs to the right of the river, especially the areas of Binondo and Sta Cruz, had focal concentration of water fountains. The presence of more hydrants in this area might indicate easier water access. Naturally, Intramuros, being the seat of the political, military, and religious power of colonial Manila, wass expected to have more water fountains. On the other hand, Binondo, which served as the city´s commercial center with a very cosmopolitan character[116] had more control of the city´s water distribution alongside the commercial district of Santa Cruz and Quiapo. Business establishments and varied economic activities were converged in these areas during the time from different commercial shops, small

[116] Chu (2010), p. 180.

and medium-scale food and beverage manufacturing industries, etc. [117] These were also the areas where the Spanish, European, American, other foreign ethnicities, creoles, mestizos, and the booming middle-class communities lived, moved, and intermingled. In contrast, one may find fewer hydrants in the areas to the left of the river and in the peripheral suburbs of Sampaloc and Tondo- suburbs that were predominantly home to the less-privileged natives.

Furthermore, the number and type of hydrants existent in each suburb could also be juxtaposed to its recorded population. Through this representation, we can give a more nuanced analysis of the water access and distribution in Manila during the time. Figure 9 measures the ratio of water fountains to the number of inhabitants per suburb using the demographic information of the capital in the late nineteenth century. For example, census data identified the suburbs of Binondo and Tondo with the highest population, with 57,048 and 37,588 inhabitants respectively. The data shows that there was one water hydrant for every 413 Binondo residents (1:413) while in Tondo the ratio was 1:648.

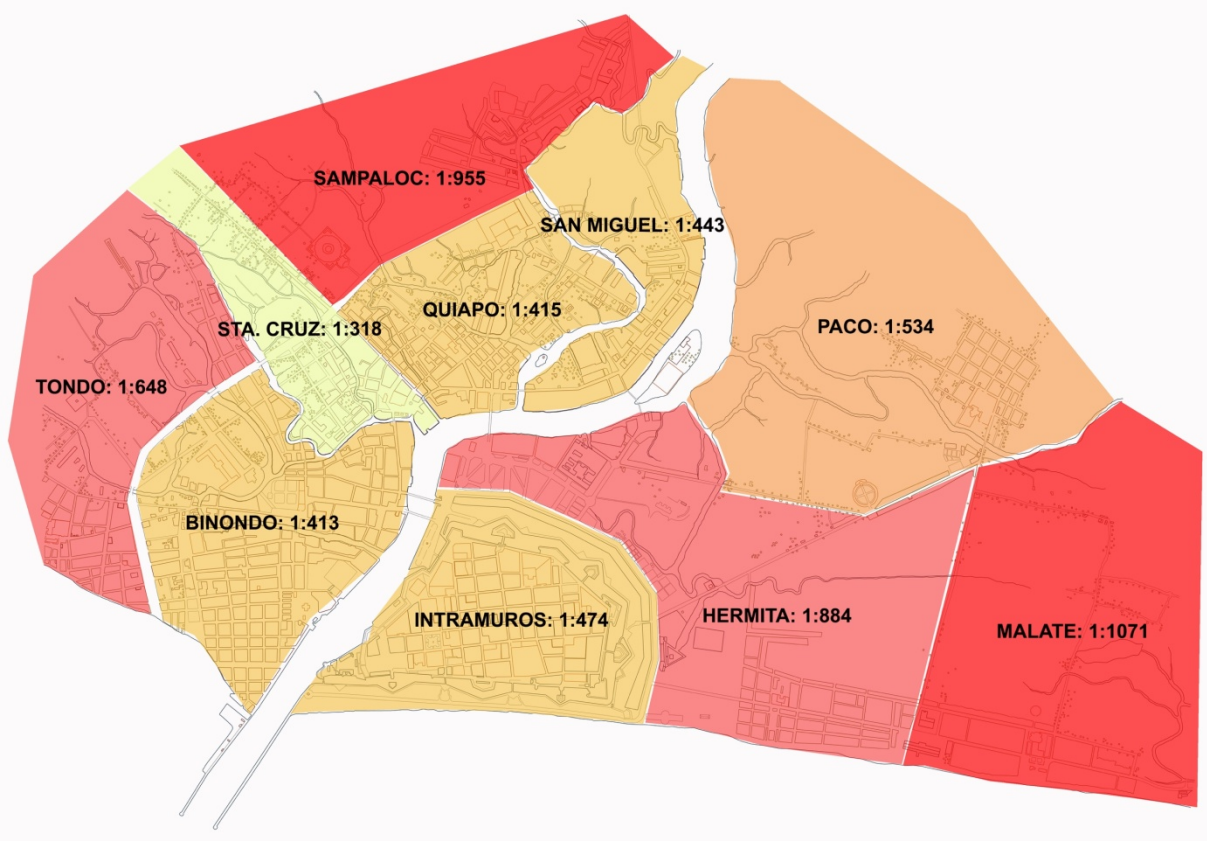


Figure 9: Map showing the ratio of water fountain to the number of inhabitants per suburb
Source: Costelo, 2020. Elaborated from the data collected in AHN, Ultramar, 491, Exp. 1, 2, 3 and 4; and Ultramar, 492, Exp. 2

[117] Lagman and Martinez, (December, 2014), p. 68.

To clearly demonstrate this data, the lightly shaded zones in Figure 9 (Santa Cruz being the most lightly shaded suburb) corresponded to the districts with low hydrant to population ratio. On the other hand, the heavily shaded areas had more population but less number of hydrants in the suburb. The figure, again, affirms that the central districts had better water access and distribution in terms of hydrant to population ratio. Meanwhile, the poor ratio of water fountains to the number of inhabitants is very much evident in Tondo which was home to poor native urban workers and in the peripheral areas of Sampaloc and the less-commercial suburbs to the left of the Pasig. In the end, the poorer classes still relied on water from the rivers and estuaries, rainwater, and wells as their principal source of water. This proved to be very risky as they exposed themselves to the dangers of cholera that swept the city in the 1880s.[118]

With the increasing legibility of late nineteenth-century Manila´s thoroughfares, we can further ask: Which specific streets had water fountains? And which specific part of the streets were the fountains located? This practical case can give us an elucidating picture. Less than two months after the inauguration of the Carriedo fountain in Sampaloc, the newspaper *El Comercio* published on 1 September 1882 the opening and operation of neighbourhood water fountains in the principal and secondary streets of Sampaloc. The specific locations of the water sources were the following:

1 water fountain	Calle Real, beside the house of Sr. Barretto
1 water fountain	Calle Real, beside the house of Sras. de Tuason
1 water fountain	Calle Real, beside the house of Sr. Guidote
1 water fountain	Segunda calle, beside the Escuela Municipal de Niños

Table 12: Report of opened public water fountains in the suburb of Sampaloc, 1 September 1882
Source: El Comercio[119]

From this table alone, it was evident that access was given priority to residents of socio-economic and political prominence as well as the important landmarks in the suburb. For instance, the Barrettos and the Tuasons were notable nineteenth-century Manila families who owned and managed large commercial interests and industries in the capital. When direct water servicing to private houses were established by city government, they were the same family names that appeared to have first acquired of the said service. Whereas, the selection of the

[118] Daniel Doeppers, "Manila´s Imperial Makeover: Security, Health, and Symbolism," in Alfred McCoy and Francisco Scarano (eds.). *Colonial Crucible Empire in the Making of the American Modern State* (Wisconsin, The University of Wisconsin Press, 2009), p. 494.
[119] ¨Noticias,¨ *El Comercio,* 1 de septiembre de 1882.

school (*Escuela Municipal*) as site for the public fountain was also telling of the colonial government´s view on public health and hygiene.

Domesticating the water

The elaboration of water systems and the changing conception of "clean water" paved the way to an increase in the domestication of water. Piped water began to enter the households of the capital and water "became part of an invented tradition of domesticity".[120] Towards the late nineteenth century, water started to flow into the private spaces of homes, latrines, bathrooms, and kitchens. Direct private access to water then became one of the indicators of late nineteenth century modernity. This also reinforced the socio-economic demarcations of the city. Filipino native neighborhoods collectively gathered in public fountains for water supply while the European, criollo, mestizo populations received piped water directly to their homes.

Water extracted from the public water fountains was free. However, the Ayuntamiento de Manila offered the privilege of directly servicing water to households by paying four centavos per cubic meter of water. With this, water became urbanized and commodified through standardized infrastructure services.[121]Aside from direct potable water service, households and building owners may also opt to install fire hydrants at 12.50 pesos per year.[122] To control private water consumption, houses were surveyed before permits were granted. Then, water meters and taps were attached to the households that were approved for direct water servicing. A typical receipt as shown in Figures 10 and 11 reflect the level of control that the Manila colonial government imposed to individuals to be able to get private access to water. The receipt indicates the name of the household owner; the complete address including the street number, street name, and name of the district.

This private servicing of water resulted to the quantification and commodification of water in the capital. Every day, water use of a household is measured through water taps and meters and is documented to produce a monthly consumption history reflecting the amount of water per cubic meters used and the corresponding fee. For instance, a certain Don Abraham García with residence at Plaza Cervantes in the district of Binondo consumed 157.780 cubic meters of water in a span of ninety-two days or 1.715 cubic meters a day from October to

[120] Gandy, (2014), p. 367.
[121] Graham and Marvin, p. 56.
[122] *Reglamento para el uso público, gratuito y a domicilio privado mediante retribución de las aguas potables del canal de Carriedo*, Manila, Imprenta de la R. Mercantil de Díaz Puertas y C. Cervantes, 1885, pp. 9-10.

December 1897. This consumption required García to pay the amount of three pesos and thirty-one centavos.[123] Meanwhile, a Chinese mestizo named Mariano Limjap paid around thirty pesos for his household´s consumption of around 815 cubic meters of water from July to September of the same year. [124]

TESORERIA
DEL
EXCMO. AYUNTAMIENTO
DE ESTA
M. N. Y. S. L. CIUDAD DE MANILA

Enero 13, 1898

Mes de Octe á Dice de 1897

NÚM. 93

SUMINISTRO DE AGUAS

D. Abrahain Garcia por el suministro de agua por caño libre en su casa n.º 3 de la calle de Plaza Cervantes del Distº de Binondo

Al Excmo. Ayuntamiento ..... DEBE.

Por el consumo de 157720 metros cúbicos de agua en los 92 días del citado mes, ó sea por 1715 metros cúbicos diarios, corresponde segun lo establecido en el artículo 21 del Reglamento vigente.

Unidades		PRECIOS Pesos.	PRECIOS Cént	IMPORTES Pesos.	IMPORTES Cént.
157720	metros cúbicos por 1715 al dia	»	04	6	31
		»			
Totales.				6	31

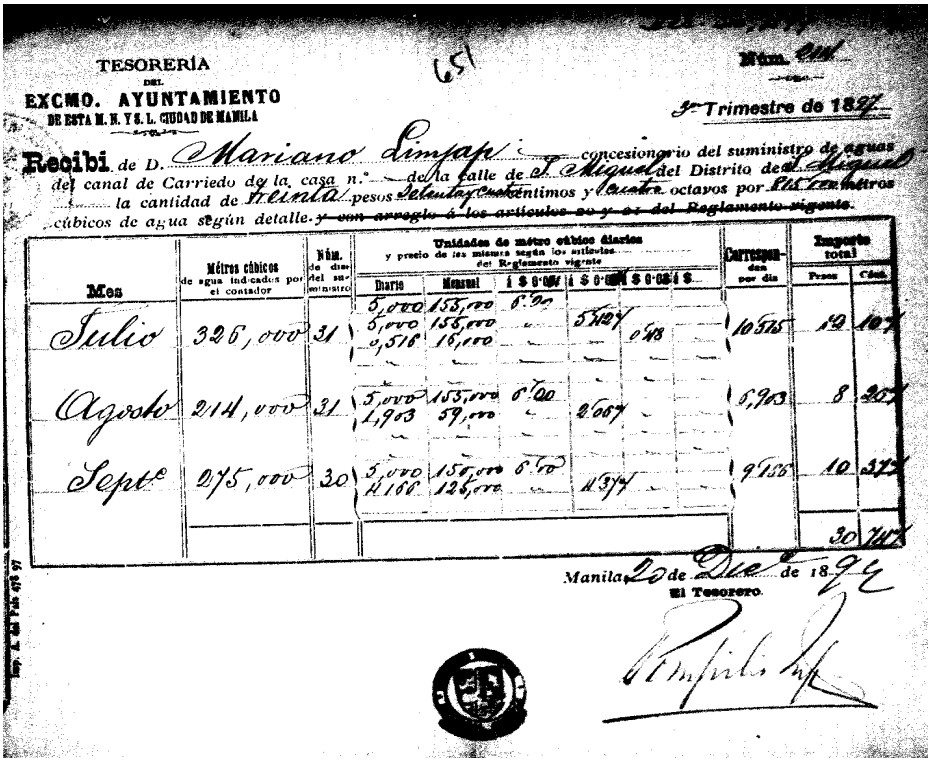
Importa esta cuenta los figurados seis pesos treinta y un centavos

Manila 13 de Enero de 1898

El Tesorero,

Figure 10: A water receipt paid by Abraham García, October-December 1897.
Source: AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1765.

[123] AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1765, Recibo del pago de Abraham Garcia.
[124] AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1766, Recibo del pago de Mariano Limjap.


TESORERÍA
DEL
EXCMO. AYUNTAMIENTO
DE ESTA M. H. Y S. L. CIUDAD DE MANILA

3er Trimestre de 1897

Recibí de D. Mariano Limjap concesionario del suministro de aguas del canal de Carriedo de la casa n.° — de la calle de S. Miguel del Distrito de S. Miguel la cantidad de Treinta pesos Setenta y cuatro céntimos y Cuatro octavos por Seis cubos metros cúbicos de agua según detalle. y con arreglo á los artículos 20 y 21 del Reglamento vigente.

Mes	Métros cúbicos de agua indicados por el contador	Núm. de días del suministro	Unidades de metro cúbico diarios y precio de las mismas según los artículos del Reglamento vigente — Diario	Mensual	$ 0.00	$ 0.00	$ 0.05	Importe total — Pesos	Cénts.
Julio	326,000	31	5,000 / 5,000 / 0,516	155,000 / 155,000 / 16,000		5	0 48	10	12
Agosto	214,000	31	5,000 / 1,903	155,000 / 59,000	6 00	2	0 67	8	67
Septe	275,000	30	5,000 / 4,160	150,000 / 125,000	6 00	11	3 74	9	74
								30	153

Manila 20 de Dbre de 1897
El Tesorero.

Figure 11: A water receipt paid by Mariano Limjap for water July-September 1897 water consumption
Source: AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1766.

In the case of Manila, permits for water service in private houses reveal the unequal and racialized nature of water access. The following table, as extracted from one of the permits of a Manila household to get direct water access, documents the amount of water intended for different water-users in a domicile.[125]

User/Intended water use	Amount of water allotted daily
A member of a European family or a European servant (Persona de la familia de los amos o sirviente europeo)	50 liters
A native servant (sirviente indígena)	25 litres
A horse	30 litres
A carriage with 2 to 4 wheels	40 litres
A garden	2 litres per square meter

Table 12: Intended water use in a domicile in Manila
Source: AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll 1764.

[125] AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1764, Solicitud del abastecimiento de agua.

The data reflects the divide even to the access of water in the context of a domicile in the colonial setting. It shows that a native servant was only allowed to spend half the amount of water that his or her European or Spanish master could consume. In fact, a horse was even entitled to more water supply than a native. To maintain the colonial government´s control on water access, the contract for direct water access among households was limited to two years. This direct access was also regulated within one domiciliary. The government applied punitive measure to private homes that redistribute, transfer or sell the water illegally.[126]

By examining the list of paying households for the years 1886 and 1887[127], it is quite expected that Binondo would record the highest number of private water access given the economic capacity of its residents as shown in Figure 12. Again, the suburbs to the left of the river as well as the peripheral and poorer suburbs of Sampaloc and Tondo had lesser number of private households with direct water access. Meanwhile, the bustling districts of Quiapo, Sta. Cruz, and San Miguel had more households with pipelines as well as Intramuros which was home to the affluent families of colonial Manila.

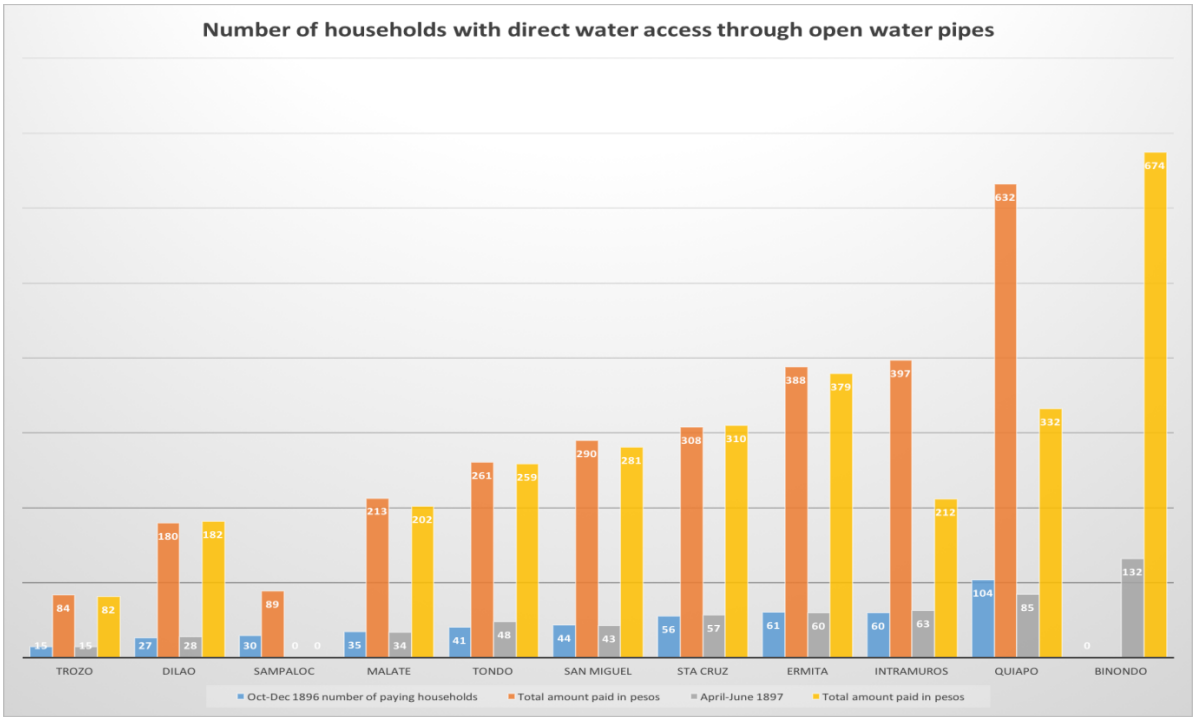


Figure 12: Number of households in Intramuros and Manila suburbs with direct private water access through open water pipes
Source: Costelo, 2020. Elaborated from the data collected in AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1771.

[126] *Reglamento para el uso público, gratuito y a domicilio privado mediante retribución de las aguas potables del canal de Carriedo* (1885), p. 12.
[127] AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1771, Relación de los recibos de aguas de Carriedo por los meses de enero a diciembre de 1886 a 1887.

In the list of paying households, (See Appendix, Chapter 5, C) one can find the names of important Spanish, European and American residents and business owners in Manila such as the Ynchausti´s, Barreto´s, Fressel, Bell, as well as mestizos, Chinese-mestizos and local elites such as the Legarda´s, Roxas´, Paterno´s, Lim-jap´s, etc. In a way, the presence of canalized water became an indicator of a modern household. Only families of political and economic importance could avail of this privilege which was limited only to almost 5% subscription of the entire households in the capital by 1902.[128]

Contaminated water and the struggles of establishing a sewerage system

The introduction of the waterworks project gave birth to the changing notions of water, such as the concept of its potability and usage. Clean, safe, and drinkable water was water conducted through tubes and pipes. Its sufficient supply and easy access was integral for the metabolism and growth of the modern body and the modern city. Aside from drinking fountains that provided clean drinking water, the fire hydrants also served as cleaning hydrants that were used to maintain the cleanliness of the city´s arteries. The Ayuntamiento de Manila in several proclamations emphasized that street washing and cleaning should be regularly carried out to ensure the city´s sanitation. As a result, it ordered the installation of water hoses to be installed in the fire hydrants to be able to wash the streets of the capital. The city opened this service for public bidding. For example, on 3 February 1894, Don Abelino Mierco got the approval of his bid to undertake the washing and cleaning of the streets of San Jacinto, Nueva, San Vicente, Dasmariñas, Norzagaray and Santa Cristo in Binondo. However, the use of water hose was strictly regulated by the colonial government due to fears that natives would utilize this in the unregulated and limitless extraction of water. It was even stipulated that the water hose would be under the safekeeping of the municipal´s architect and the Fire Brigade (Cuerpo de Bomberos).[129]

In the construction of modern cities, sewer networks were linked to the water systems. It is undeniable that by the last decades of Spanish rule, there was already a system in place for waterworks in Manila. However, a sewerage system, which was equally important for the creation of a modern and functional hydraulic infrastructure, remained to be unestablished,

[128] Daniel Doeppers, *Feeding Manila in Peace and War, 1850-1945* (Quezon City, Ateneo de Manila University Press, 2016), p. 256.
[129] AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1769, Informe de José Irastro al Corregimiento de Manila, Manila, 3 de febrero de 1894.

fragmentary, and unintegrated. A water infrastructure that would serve the public health of the city infused both the waterworks and sewerage systems.

The very poor drainage and sewers of the city threatened the contamination of the piped water that ran through the city. By the late nineteenth century, Manila´s waste was all over the city´s thoroughfares and waterways. Latrines and cesspits were already mid-nineteenth century fixtures in public structures and homes of the well-to-do classes of Manila. For instance, the principal markets such as Divisoria and Quinta, etc. as well as the city slaughterhouses were already equipped with fixtures for flushing body waste.[130] However, an integrated sewer network that would properly collect and drain these wastes was lacking. Most of the plans only indicated that pipes and tubes were to be connected from these private wash areas that would directly lead to the nearest body of water- the esteros or the Pasig river. The population explosion of Manila naturally led to a sanitary problem with regard the disposal of human waste.

Towards the late nineteenth century, colonial authorities realized that piped water would be for naught if the waste disposal and sewerage system of the city would not be improved and reformed. One of the sanitary threats the the authorities tried to address was the estero problem. Huetz de Lemps´ study on nineteenth-century Manila explained that the esteros of Manila already alarmed and concerned the Spanish hygienists and sanitary professionals as they were converted into stationary drains and dumps of waste.[131] In his investigation, Huetz de Lemps reconstructed estuaries that enveloped the entire urban sprawl. A total of 19 kilometers of narrow esteros, usually only with 10 meters width, navigated the right bank of the Pasig which included: the estero of Binondo and the canal de la Reina (2700 meters), the esteros of San Jacinto (1200 m.), Meysic (500 m.), Magdalena (2000 m.), Tutuban (800.), Trozo (700 m.), San Lazaro (1000 m.), Dulumbayan and Sibacon ((1200 m.), Quiotan (900 m.), Quinta (300 m.), Gunao (150 m.), Quiapo and Curtidor (900 m.), Bilibid (1600 m.), Tanduay (700 m.), San Miguel (1200 m.), Sampaloc and Uli Uli (1400m.), connecting estero of Quiapo to Tanduay (400 m.) and one crossing Tanduay island (400 m.).[132] These esteros became one of the threats to contaminated piped water in the city.

To improve the state of these waterways, a Junta was created tasked on the improvement of esteros in Manila through a Royal order on 30 August 1882.

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[130] AHN, Ultramar, 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo, Reconocimiento del director de obras públicas y del señor alcalde 1º de Tondo.
[131] Huetz de Lemps (2001), p. 490.
[132] Ibid.

One of its recommendations was the classification of the different esteros in Manila into the following categories.

> 1. Navigable estuaries that should be improved and channelled for the navigation of small boats. The esteros of San Sebastian and Curtidor were identified in this category.
> 2. Estuaries that should be covered with vaults to serve as collector sewers. The idea was that these esteros, such as Quiotan, Sibacon, Dulumbuyan and Trozo would be utilized to convey waste from the houses and other producers of waste to the larger tributary.
> 3. Esturaries that should be channelled economically for the drainage and water supply of the districts around them. The esteros of Sampaloc, Bilibid, Magdalena y San Lázaro were examples of theses estuaries.
> were classified in this type.
> 4. All the other esteros on the right side of the Pasig river bank that were not mentioned should be covered[133]

During the last years of the nineteenth century, the problem of human waste had to be confronted and addressed. Engineer Crespo y Heras authored a plan on how to improve the city´s sewerage. Herras y Crespo maintained that the construction project related to sewage should begin first and foremost in the management of each and every urban household. The engineer commented that the living habits of the many natives and Chinese in Manila did not help in the betterment of the city´s water and waste disposal system. He remarked:

> The natives who live in the extreme quarters composed of houses of light materials are not concerned at all in clearing away the excrements that they produce; and apathetically inhabit in the midst of these wastes. [134]
>
> *El vecindario indígena de los barrios extremos que habita casas de materiales ligeros, para nada se preocupa de alejar las heces que produce; y vive, estoicamente, en medio de ellas.*

This situation was aggravated with the fact that the city was full of lightly-built cesspools many of them located in public roads and sewers that did not adhere to any plan and layout and constructed out of poor and inappropriate materials.

City engineer Heras y Crespo first noted that in almost all existing modern studies on city planning had already abandoned the method of throwing human waste into the city´s waterways. He remarked that the system was only practiced in very special cases when the waterways´ flow were much stronger and rapid than the water coming from latrines and other

[133] Carlos de las Heras y Crespo, *Ante proyecto de saneamiento de Manila* (Manila: Tip. Lit. de Chofré y Comp., 1896), pp. 5-6.
[134] Ibid., p. 4.

contaminants. Also, the current should always be very heavy and impetuous for this system to function. [135]

The engineer cited that the modern techniques employed in the cities of London, París, Berlín, Dantzic, Barcelona, Bilbao, and Valladolid that involved the separation of clean and filthy waters, throwing the waters into the river and estuaries, pumping the water through pipes and tanks leading to argricultural treatment fields required heavy costs and massive hydraulic works that were not yet within the reach of the Manila city council.[136]

Given the limited funds of the municipal government for a massive sewerage systems project, the engineer proposed some measures that could be made to at least improve this condition. He said that since human waste were already spilled into the waterways, the best measure would be to distribute the channelling of these wastes and, as much as possible, move them away from the most populated neighbourhoods. To achieve this, collector sewers would be identified among the existing esteros in the city. The idea was two identify two big collector sewers that would drain the wastes to the river or directly to the bay. In this manner, wastewater would only be concentrated in select esteros. The esteros of Dulumbayan, San Lazaro all leading to canal de la Reina and estero de Sta. Cruz leading to the Pasig river were identified for this purpose. These esteros should be dredged and widened to serve the purpose.

Heras y Crespo argued that for the sewerage system and private drains to function well for Manila, it was important that all filtering cesspools especially in public streets be stopped and covered while those located in private spaces could be transformed to Mouras drains.[137] It was also suggested that all private latrines be toilet siphons provided with water through fixed deposits. Vents should be provided by means of chimneys above the highest windows using iron pipes of 4 to 12 centimeters in diameter.[138] The engineer said that this private drain would significantly improve the quality of water among neighborhoods. To prove his point, he mentioned in his *anteproyecto* that samples of wastewater were analysed comparing the neighbourhood with Mouras drains and communities which had none.

The wastewater found in the sewer of Galvey Street, where private drains of houses were located, was compared to a sewer nearby where urban residents pour their wastes and faeces into the said sewer. The two samples collected from these drains were brought to the *Laboratorio Municipal de Manila* for analysis by chemist-pharmacists Antonio Casanovas and

[135] Ibid., p. 7.
[136] Ibid., p. 8.
[137] Ibid., p. 9.
[138] Ibid., p. 46.

[Antonio] Luna.[139] The specialists provided the following chemical, micrographic, and bacteriological analysis in comparing the two specimens.

	Sewer water sample from houses with private drainage	**Sewer water sample from houses without drains**
Physical Characteristics	Liquid with light yellow color, slightly cloudy; hydrogen sulphide odor (similar to rotten eggs odor)	Liquid is of yellowish odor; cloudy; with matte in suspension and quite marked blackish deposit
Chemical Characteristics	The paper impregnated with lead acetate solution suspended in the bottle that contains the sample blackened strongly; Gave a red, well-marked coloration using the Nessler´s reagent	The paper impregnated with lead acetate solution suspended in the bottle that contains the sample blackened strongly; Gave a red coloration using the Nessler´s reagent
Microscopic and Bacteriological Analysis	Presence of great amount of plant cells, starch grains, fibers of a muscular altered nature	Presence of cells in vegetal nature, vegetable and animal fibers, starch grains, and various elements among which were some amoebas
Cuantitative Bacteriological Count	1,950,000 bacterias for every liter	9,000,000 bacterias for every liter

Table 13: A comparison of two water samples as analysed by Antonio Casanovas and [Antonio?] Luna- wastewater from houses with drains and with inexistent drains
Source: De las Heras y Crespo (1896)[140]

After their analysis, Luna and Casanova concluded that that it was more recommendable to use the Mouras drainage system and pressed that urgent reforms be made with the conditions of the waterways. Moreover, they added that clogged esteros should be prevented as thos was one of the primary causes of the worsening of the water quality of the city.

However, as Huetz de Lemps pointed out, these measures did not see its full and effective implementation as the steps taken were just like ¨a drop in the ocean¨. Heras y Crespo´s proposal was made almost at the end of Spanish rule in the Philippines so no large-scale infrastructures were added aside from the improvement projects in the *estero* of San

[139] Heras y Crespo did not mention when was the laboratory analysis was made. He also only mentioned, ¨doctor Luna¨. I argue that Heras y Crespo was referring to Antonio Luna. Luna was appointed *profesor químico* of the *Laboratorio Municipal de Manila* (LMM) after his return to the Philippines from his studies in Europe. Martínez argued that during this time, with the efforts of Anacleto del Rosario- the first Filipino chemist, Filipino chemists were already pushing for LMM not only as a mere laboratory but as a real ¨health and hygiene institute.¨
[140] De las Heras y Crespo (1896,) pp. 42-43.

Sebastian and Binondo.[141] A complete shift in the public hygiene habits of the urban residents also did not take place.

With inadequate access to drinking, fragmentary sewerage system, and poor hygiene practices, the persistence of water-borne diseases and illness were not eliminated. For instance, Don Vicente Cavanna, municipal doctor of the district of Tondo, expressed serious concerns on the high rate of mortality, especially among poor children, caused by *gastro-enteritis.* The medical doctor emphasized that it was caused by a myriad of factors: from the lack of private hygiene among the residents, lack of safe and potable water, poor alimentation, etc. The doctor remarked that the children and the adult population were disgustingly left in prolonged exposure and contact with unproperly disposed excrements of the neighbourhood.[142]

Delineating and laying out the urban space of the city

The waterworks project, the biggest integrated and inter-suburb public works project in the second half of the nineteenth century, led to a spatial reconfiguration of the city. In terms of urban layout, infrastructures such as waterworks and sewage systems represented the features of a modern city. The succeeding figures reconstruct the evolution of the pipeline distribution in the capital. Figure 13 shows the original pipe flow (represented in red lines) in the capital as proposed by Palacios. Upon further studies and examination of the board of engineers of the JCOP, sometimes as a result of the appeals to integrate some areas to this pipe network, additional lines were incorporated to the plan as shown by Figure 14. Here, a direct line connected the principal artery that emanated from Sampaloc to the burgeoning district of San Miguel. By the late century, the suburb was not only home to Malacañan Palace but to the increasing number of food and beverage manufacturing (San Miguel and Tanduay) companies by the Barrettos and Tuasons. The blue lines correspond to these supplementary arteries. Finally, Figure 15 shows the reconstructed final pipe network that were put in place in Manila. The JCOP also translated into the plan the linking of the primary suburbs of Binondo, Santa Cruz, Quiapo, and San Miguel forming a continuous conduit in these important suburbs. The natives quarters of Trozo and Tondo were also connected by a single line which crossed the Tondo-Binondo zone that would be the station of the first railways system in Luzon. To

[141] AHN, Ultramar, 586, Exp. 1, Proyecto de mejora de los esteros del puerto interior de Manila (estero de Binondo): Extracto del expediente, 1882.
[142] Vicente Cavanna, ¨Causas que favorecen las gastro-enteropatías en estos climas,¨ *Crónica de Ciencias Médicas de Filipinas*, tomo I, año 1 (agosto de 1895), pp. 47-53.

integrate the two banks of the city, a line was made to cross from the area of San Miguel to the Arroceros-Paco districts on the left bank of the Pasig river.

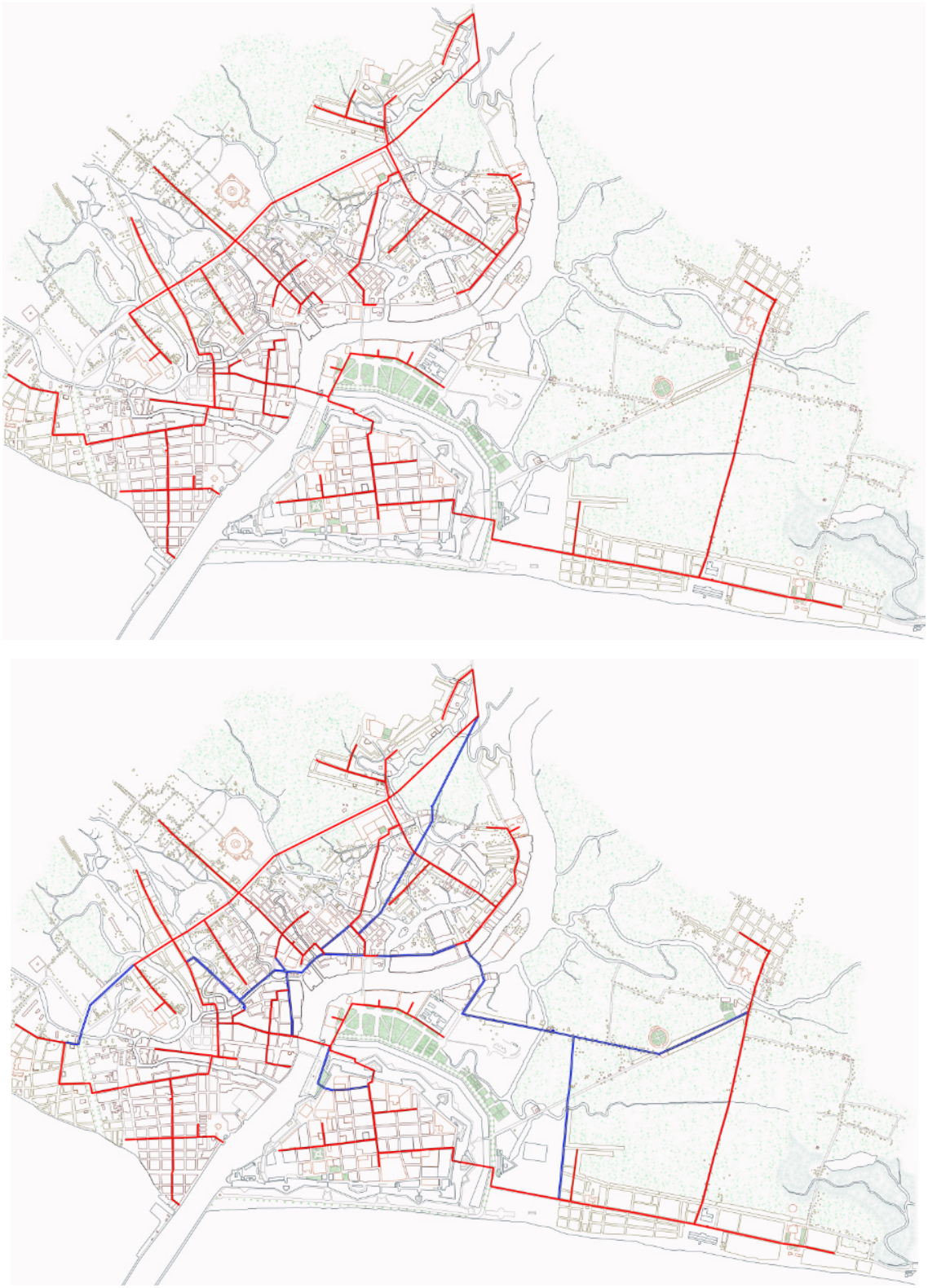


Figure 13 (above) and 14 (below): The figure above is the original pipe network plus the modifications inserted by the Junta Consultativa de Obras Públicas (JCOP) as shown below *Source:* Costelo, 2020. Elaborated by using the data from AHN, Ultramar, 491, Exp. 1, 2, 3, 4 and Ultramar 492, Exp. 2.

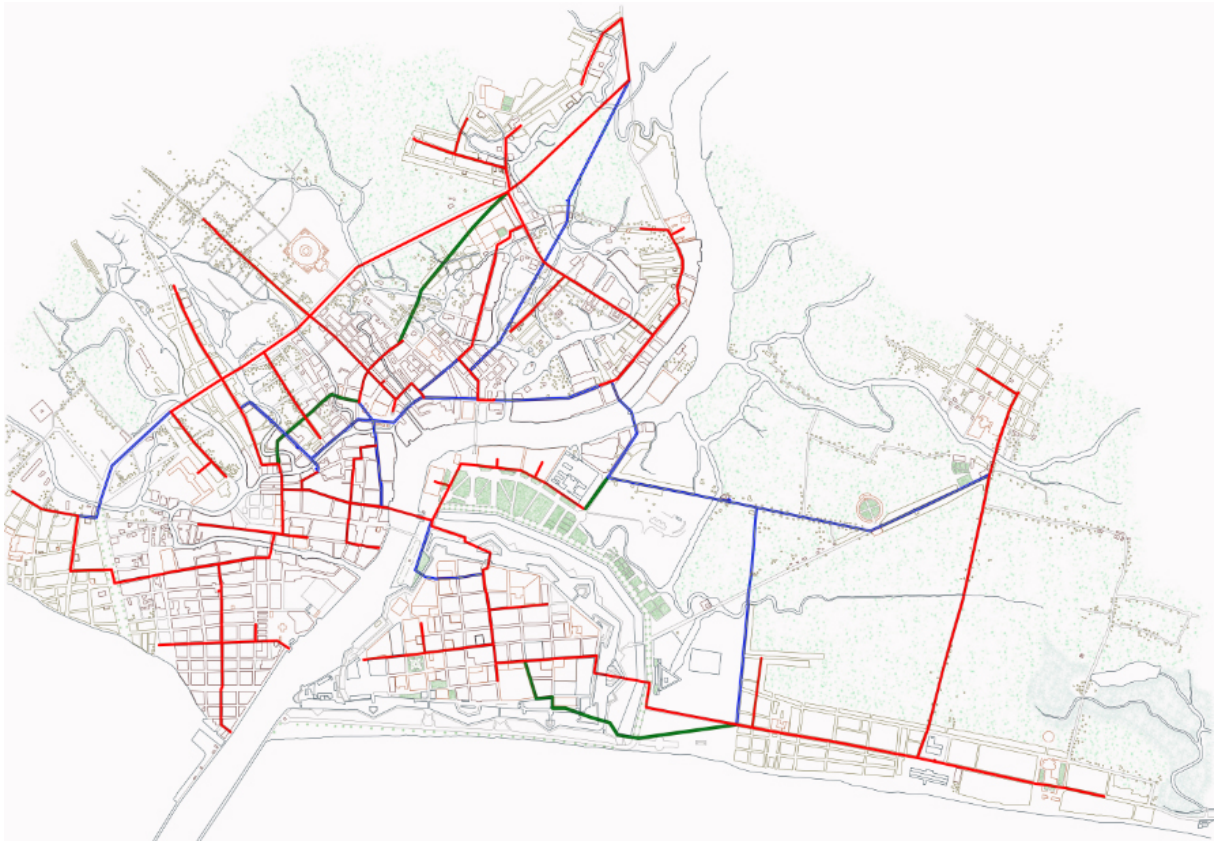


Figure 15: The final network of pipes for the city´s waterworks
Source: Costelo, 2020. Elaborated by using the data from AHN, Ultramar, 491, Exp. 1, 2, 3, 4 and Ultramar 492, Exp. 2.

The water canals and pipes literally served as connecting lines of a rapidly growing city. Lands had to be surveyed and classified to administer the water distribution in the city which then led to more extensive delineation and laying out of urban space in the capital. Inspector General Manuel Ramírez Bazán wrote on 17 August 1886 to the Ayuntamiento de Manila with regard the urgent need of mapping out the city and its suburbs that would show a clear and complete delineation of the suburbs´ jurisdiction with respect to the waterworks network.[143] The colonial government through its engineers and land surveyors conducted surveys that produced land appraisals to produce a more complete record of the lands of the city and its suburbs. The first type of information that was gathered was the land´s geometric form, it´s type, dimensions, and boundaries with a detailed description of the street name and number as well as the name of the property owner. Then land measurement was undertaken after which a land declaration is made that classified lands as cleared lands, lands prone to flooding, grassy lands, and lands used for rice cultivation. Finally, the land is appraised with

[143] AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1764, Expropiación de Terrenos, Informe de Manuerl Ramírez Bazán, 17 de agosto de 1886.

the price of expropriated lands. By 26 of August 1886, the total amount of expropriated lands for the waterworks project reached to 9,624 pesos.[144]

Memoirs of these surveys reveal a new appreciation and valuation of land locations and property. This was specifically observed when the colonial government had to acquire lands where the water pipelines had to cross. Naturally, properties that were near public fountains and water lines became prime locations such as when alterations were done in Tanduay and Arlegui streets in Quiapo. Based on the memoirs and blueprint of the waterworks project, the colonial government identified priority areas for water access. For example, there were explicit directions that pipes should reach other public works projects of the city such as the slaughterhouses and markets in the suburbs. The colonial authorities wanted to lay out pipelines on streets and lands of public domain to be able to monitor their state. This was the reason why there were changes in the pipelines route so that pipes would pass along the Real Fábrica de Tabacos in Meisic and the Carenero warehouse to have water access.[145]

It was also clear to the colonial government that the streets with houses made up of strong materials and areas with large population were the priority areas where pipelines would pass through. This was the case when Inspector General Ramírez Bazán reported the modification of the route of the pipes that distribute the water in the suburb of San Fernando de Dilao or Paco. The alteration in the blueprint consists in laying out an extension of 1,280 meter-pipeline to Real Street towards the direction of the town of Santa Ana. According to the Inspector General, "the advantages of the new pipeline route is unquestionable since the Real Street is the main street of the suburb where the best types of houses are located and the largest population of the area reside."[146]

[144] AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1767, Informe de la Inspección General de Obras Públicas, Manila, 26 de agosto de 1886.
[145] AHN, Ultramar, 492, Exp.2, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Presupuestos de gastos. Modificaciones del trazado de las tuberías, 1881-1886, Informe del Inspector General Ramírez Bazán, Manila, 29 de mayo de 1884.
[146] Ultramar, 492, Exp.2, Aprobación del proyecto de abastecimiento de aguas potables a Manila: Presupuestos de gastos. Modificaciones del trazado de las tuberías, 1881-1886, Informe del Inspector General Ramírez Bazán, Manila, 12 de mayo de 1884.

Chapter Concluding Notes

After the end of the Spanish rule in the Philippines, water hydrants were available for free in the different public spaces in Manila.[147] In 1904, Mr. Desmond Fitzgerald, consulting engineer of the proposed new water supply of the city of Manila of the American colonial government in the Philippines reported that the capacity of the Manila waterworks system drawn from the Marikina river had already been nearly reached. His proposal was to either expand the existing system or find a new source that would supply Manila´s exponential need for clean drinking water. Despite the limitations of the Manila waterworks, Fitzgerald however recognized the system as "an admirable structure for an earthquake country".[148]

The Manila waterworks system as a public works project symbolized the triumph of engineering in the last decades of Spanish colonial rule in the Philippines. It represented an optimistic view of how technological solutions could be devised to respond to the public health and sanitation problems of the colony. The creation of a specialized institution dedicated to the construction of public works projects, the presence of engineers with a broader technological know-how, the open participation of different players in the field of science and technology, the evident political will of the municipal authorities of Manila and the central colonial government, and the changing attitudes towards sanitation, public health, and urban space in a rapidly urbanizing city were all vital factors for the realization of one of the biggest sanitary infrastructure projects in Manila. Indeed providing safe and clean water was the colonial government´s direct response to the cholera epidemics in the nineteenth century[149] and the growing pressure of providing a basic service to a growing colonial capital.

However, the waterworks inaugurated in 1882 did not directly mean the eradication of water-borne diseases and illnesses. This present study exposes that the laying out of the waterworks system did not guarantee equal access and full distribution of clean, safe, and affordable water for the entire inhabitants of the colonial capital. In Manila, while it is important to recognize the construction of a revolutionizing public work which was the waterworks system, it is also equally important to ask: What was the reach of the water supply in Manila? Who had access to it? These questions once answered would paint a picture, such as in the case of Manila, of an incomplete modernity because there were "citizens who could lay claim to

[147] Doeppers in McCoy and Scarano (2009), p. 494.
[148] *Annual Report of the Municipal Board,* "Report of Mr. Desmond Fitzgerald upon the proposed new water supply", Manila, 28 April 1904.
[149] Huetz de Lemps, p. 490.

potable water and they were 'subjects' who were left to make do as best as they could."[150] Certainly, the privileging of spaces and inequities of basic services such as water access is one salient example of imperial and colonial systems that lingered in many urban landscapes. Striking similarities in the British and French colonies affirm that these inequalities reinforced the structural imbalances even up to the postcolonial period.[151]

This study presents the complex intersections between technological innovations and the many layers of the politics of sanitation and water access and exclusion in a colonial context. As with other goods and urban services, the circulation of water and its mechanisms of access and exclusion reveal relations of economic and political power.

[150] Gandy, (2014) p. 368.
[151] Hilary Hungerford and Sarah L. Smiley, ¨Comparing colonial water provision in British and French Africa,¨ *Journal of Historical Geography*, 57 (2016), pp. 74-83.

Chapter 6.

Los mataderos y mercados públicos: Provisioning the Colonial Capital

¨[e]s incuestionable la necesidad de dotar a la capital del archipiélago
de un matadero que sustituya ventajosamente al que hoy existe
en el populoso arrabal de Santa Cruz, cuyas circunstancias
son tales que afectan constantemente a la salubridad pública
y en la actualidad sin duda es una de las principales causas
que hacen más tenaz e intensa
la funesta epidemia varioloso reinante.¨[1]

¨[t]he need to provide the capital of the archipelago
with a slaughterhouse that replaces the one that exists today
in the populous [suburb of] Santa Cruz is unquestionable,
the conditions of which constantly affect the public health and
undoubtedly one of the main causes that make the current epidemic
more tenacious and intense.¨

Ideas of public well-being and hygiene were evidently incorporated in the public works and urban projects in Manila. The construction and reconstruction of slaughterhouses *mataderos* and public markets *mercados públicos* was part of a bigger scheme of sanitary infrastractures that characterized the second half of Spanish colonial rule in the Philippines. ¨Public salubrity¨ (*salubridad pública*), ¨sanitation¨ (*sanidad*) and ¨public health¨ (*salud pública*) were constant catchwords in the correspondences, memoirs, plans, and blue prints of medical and health practitioners, sanitary and urban reformers, engineers, architects, and colonial administrators with regard the development of infrastructures geared towards the improvement of the capital´s food supply and distribution.

This chapter focuses on two inter-related public works projects, the slaughterhouse (*matadero*) and the public market (*mercado público*). Why were these projects important in understanding the relationship between colonial public works and the colonial government´s policies of sanitation, order, and control in the colony? In the simplest sense, this study chose to highlight the *matadero* and the *mercado público* because these infrastructures reflect the attempts of the colonial administration in ensuring the provisioning of the capital with clean and safe food and putting order and control in its production, distribution and consumption. On

[1] AHN, Ultramar, 5320, Exp. 100, Sobre construcción de una nueva casa matadero en Manila y entregar a la Administración Local las pieles de reses mayores que se maten para el consumo en el radio municipal de dicha ciudad, Carta del Corregimiento de Manila, 3 de febrero de 1872.

a more complex scale, these urban projects in Spanish Manila mirror the shifting attitude towards food consumption and the changing ideas with regard urban space and sanitation.

Advances in science and technology of the time reaffirmed the ancient knowledge that food is both a source of nourishment and a source of disease. Aside from regulating meat and other provisions that come out of these infrastructures, the slaughterhouses and markets became sites of control. Like the cemetery, these public infrastructures were considered as possible sources of noxious and putrid elements. This could be linked to what Michel Foucault refers to as the ¨police of health¨ where he specifically mentioned the abattoir, alongside the cemetery, as one of the primary spaces of social control in the city. He mentioned,

> The disposition of various quarters, their humidity and exposure, the ventilation of the city as a whole, its sewage and drainage systems, the siting of **abattoirs** and cemeteries, the density of population, all these are decisive factors for the mortality and morbidity of the inhabitants. The city with its principal spatial variables appears as a medicalizable object.[2] (emphasis supplied)

An important aspect of urban medicine in this period was the determination of ¨healthy places¨ and the analysis of areas that could accumulate and concentrate elements that provoke diseases.[3] Slaughterhouses and cemeteries became the focus of this urban supervision and control. As a result, the physical, spatial, and administrative aspects of these urban spaces remained under the vigilance of the colonial government. These and other developments were key factors in the transformation of laws and policies and the construction of public works and infrastructures that regulate human and non-human activities involving food supply and distribution.

This chapter first briefly outlines the development and evolution of slaughterhouses and public markets within the late eighteenth century to the nineteenth century context and relating this to the development of disease theories from the miasmatic theory of disease up to the advances in bacteriology and veterinary medicine towards the late nineteenth century. The second and third part discusses the public works projects of constructing and reforming slaughterhouses and public markets of the nineteenth century Spanish colonial government in Manila highlighting the reforms in the physical attributes of the infrastructures to respond to the challenges of public health and hygiene. Then this chapter attempts to analyze the slaughterhouses and public markets as spaces where techniques of documenting and profiling, inspecting, and policing were observed to respond to the urban environment´s challenges of

[2] Michel Foucault, ¨The Politics of Health in the Eighteenth Century, ¨ in *Power/Knowledge: Selected Interviews and Other Writings: 1971-1977*. Edited by Colin Gordon (New York: Pantheon, 1972), 170.
[3] Macarena Ibarra, ¨Hygiene and Public Health in Santiago de Chile´s Urban Agenda,¨ *Planning Perspectives* vol. 31, no. 2 (2016), 183.

sanitation, order, and control. Lastly, this chapter presents the varied facets of contentions, contestations, and lapses in control amid the many layers of colonial regulation and inspection that surrounded the slaughterhouses and public markets.

A. The *matadero* and the *mercado público* in the late eighteenth century to the nineteenth-century context

As of present, there is no existing definitive study on colonial slaughterhouses and public markets during the Spanish rule in the Philippines. While Daniel Doeppers´ ¨Feeding Manila¨[4] allotted a chapter on the meat supply in the capital during the late nineteenth century to the early twentieth century, his discussion focused principally on the aspect of food provisioning and did not examine the slaughterhouses and public markets as sanitation infrastructures.

A survey on the existing literature on slaughterhouses and public markets reveals that this subject matter was dealt mostly by Western literature. Generally, studies on slaughterhouses are still limited and inadequate. One of the pioneering and often-cited books about this subject is *Meat, Modernity, and the Rise of the Slaughterhouse.* Edited by Paula Young Lee, the book which is a compilation of articles offers an interdisciplinary view on the history and development of different slaughterhouses in the modern world which documents the rise of the modern invention of centralized municipal abattoirs and relating it to the broad themes of sanitation, hygiene, and profitability.[5] One aspect that should be highlighted in this book is that only one out of twelve articles deals with a non-Western and a non-North American case. In Europe, the French, German and English abattoirs were the most-studied cases as pioneers of the slaughterhouse technology. According to Dorothee Brantz, the presence of private slaughterhouses in the late eighteenth century Paris was ¨an ultimate symbol of the ubiquitous filth and miasmic pollution¨ thus reforms were pushed to construct the first modern public slaughterhouses that opened in 1818 in the French capital.[6] In the second half of the nineteenth century, British public abattoirs developed from the ¨dispersed, private, and invisible¨ to the ¨centralized, public, and policed¨ slaughterhouses.[7] In the case of Berlin,

[4] Doeppers (2016).
[5] Paula Young Lee (ed.), *Meat, Modernity, and the Rise of the Slaughterhouse* (New Hampshire: University of New Hampshire Press, 2008), p. 8.
[6] Dorothee Brantz, ¨Slaughter in the City: The Establishment of Public Abattoirs in Paris and Berlin, 1780-1914¨. Dissertation. University of Chicago. 2003. p. 55
[7] Christopher Otter, ¨Civilizing Slaughter: The Development of the British Public Abattoir,¨ *Food and History,* vol. 3, no. 2 (2005), p. 31.

reforms in the municipal slaughtering facilities were introduced rather late in the nineteenth century when the capital´s slaughterhouse opened in 1881.[8]

Public health and hygiene within the Spanish empire was not a concern that originated only in the nineteenth century. Studies show that public hygiene as a conceptual and practical problem was already a great concern which was raised by the Bourbons in the second half to the late 18th centuries. This idea was not only limited to the metropolis but also reverberated in the colonies beyond the peninsula.[9] The first half of the nineteenth century saw the significant health and sanitary reforms related to food supply (*abasto público*) as seen in the institutionalization, by virtue of municipal laws, the reforms in animal meat and food inspection and by association those spaces related to food supply such as the *matadero* and the *mercado público* as seen in the *Memoria Facultativa sobre sanidad de las carnes* authored by the *Junta de Profesores de la Escuela de Veterinaria de Madrid* in 1837.[10]

In the Spanish empire´s capital, it was in 1840 when the municipal authorities of Madrid formally regulated slaughterhouses through an urban governance regulation.[11] José María Caballero, *regidor constitucional* of Madrid, was tasked to author the *Proyecto de reglamento de carnes y reglamento interior de las casas mataderos* which practically specifies all the regulations and protocols regarding animal slaughter, meat distribution, and food supply in the city. The guidelines include the enumeration of specific positions from the veterinarian inspector and slaughterhouse administrator to the butchers and meat loaders and their corresponding tasks and responsibilities. This document became the blueprint and model for the regulations that were implemented in the Philippines. According to Caballero, the branch of urban governance related to controlling food supply and public health has been improperly managed for a long time. The government´s abandonment and lack of attention to this aspect of urban administration resulted to the detriment and harm of public health, public food supply, the rural economy, the well-being of stockbreeders and animal producers and even to the Municipal Treasury. There was widespread abuse, deception, and fraud brought about by the absence of regulations in the slaughterhouse and public markets. Consequently, the inadequacy of rules and laws brought harmful effects to especially to the city´s population. He warned that the ¨government´s ill-management and indifference will embolden the perpetuation of frauds

[8] Dorothee Brantz, ¨Animal Bodies, Human Health, and the Reform of Slaughterhouses in Nineteenth-Century Berlin, ¨ *Food and History* vol. 3, no. 2 (2005), p. 194.
[9] See studies of: Alzate Echeverri (2007).: Jori (2012).; Ibarra (2016); Crowe (2012).
[10] Enrique Jodra Trillo, *Instauración y consolidación de la inspección veterinaria de carnes en Madrid en la primera mitad del siglo XIX*. PhD Dissertation, Universidad Complutense de Madrid, 2016, p. 84.
[11] José Caballero, *Proyecto de Reglamento de Carnes y Reglamento Interior de las Casas-Matadero* (Madrid: Imprenta de D.L. Amarita, 1840).

and the multiplication of trickery that lead to the disorderliness between the stockbreeders, food suppliers and the marketplace, to the increase of meat and food prices, to the practice of meat smuggling, and worse to the dangerous practice of clandestine butchering which the people will pay at a good price in the form of diseases¨.[12]

The *Proyecto de Reglamento de Carnes y Reglamento Interior de las Casas Matadero* reflects the preoccupation of the metropolis´ officials, urban planners, health practitioners as well as sanitation officers to the origin, spread, and prevention of disease. The works with regard the construction of slaughterhouses in nineteenth century cities reveal the impact that the *miasmatic theory of disease* on the erection of sanitary infrastructures. Sanitary reformers considered the ¨rotting organic matter outside slaughterhouses as miasmatic¨.[13] Like in the other European metropoles, the harmful effects of the disease-causing atmospheric mutations (*¨mutaciones atmosféricas¨*) or miasma dominated the debates in nineteenth century Spanish urban policies and administration. Indeed, medical and sanitation experts both in the metropolis and in the colony emphasized that the disease-causing miasma rest in vapors emanating from rotting organic matter. The problem of miasma in the colony was not only limited to human cadavers because ¨noxious trades¨ which included slaughterhouses, piggeries and tanneries were also considered as medical and hygienic threats.[14] This idea played a major role in the unfolding of sanitary reforms in the urban environment beginning in the latter part of the eighteenth century to the nineteenth century such as constructing sanitary infrastructures.

However, one interesting aspect of the Madrid 1840 *Reglamento* was that while it recognized the need to impede the diffusion and transmission of the noxious miasma, it also highlighted the role of nutrition, dietary factors, and food hygiene and safety in the origin and dispersion of disease. Caballero emphasized this because there were illnesses that were attributed to the contaminated miasma, when in fact, the real cause was the unhealthiness of the food (*insalubridad de los alimentos*). He cited that this failure stems from the negligence of food and meat inspection and due to the absence, incapability or lack of expertise of individuals who were tasked to undertake the inspection. He criticized that they do not have the proper background in meat analysis and have insufficient knowledge about the processes that alter the qualities of safe and healthy meat as well as the factors that stimulate the progression of disease-causing attributes of meat and food in general.[15] He believed that these were essential aspects

[12] Ibid., p. 6.
[13] Marc Trabsky, ¨Institutionalising the Public Abattoir in Nineteenth Century Colonial Society,¨ *Australian Feminist Law Journal* vol. 40, no. 2 (2014)172.
[14] Ibid., p. 169.
[15] Caballero, p. 8.

in urban governance and added that, ¨If the first need of every intelligent being is that of its individual preservation; the first vision and duty of any government is health preservation through means that are within reach of all individuals.¨[16] The classic tradition of *higienismo* based in the miasmatic theory had prevailed for a long time. In the late nineteenth century, however, new scientific findings demonstrated that live microorganisms could have a malicious influence over human beings and animals, and that each infectious disease was caused by a responsible microscopic agent. By the second half of the nineteenth century towards the late nineteenth century, developments in bacteriology and epidemiology changed the landscape on how animal meat and food supply were examined. With the outbreak of rinderpest in Manila and its nearby provinces in the 1880´s[17], the regulation and surveillance of the slaughterhouses and public markets and the increased role of veterinarians and health professionals not only as meat inspectors but also as sanitary police became more pronounced in the capital.

In Manila, the images and narratives of the ¨miasmatic cemetery and the miasmatic slaughterhouse¨ were also utilized to justify the isolation or segregation of burial places and slaughtering practices in the *extramuros* or in less populated areas outside the city. Animal slaughter is removed as far as possible from the lives of the citizens as slaughterhouses were separated from the populous areas of the city. These ideas were the same ideas that the colonial government used in the construction of a new slaughterhouse in Cuba, one of the Spanish colonies in the Ultramar, specifically in the city of Santiago de Cuba when the colonial government reported that the old structure compromised the public health due to its unsanitary and filthy state.[18]

The colonial government in Manila became preoccupied not only with the construction of sanitation infrastructures but also with the promulgation of sanitary codes through urban policies (*policía urbana*). This was proven when the Corregimiento de Manila promulgated in 1867 the *Reglamento para el régimen interior de la casa-matadero* and the *Reglamento para el régimen de los mercados públicos* which standardized and regulated the different procedures and practices in the slaughterhouses and public markets. These regulations that were implemented in colonial Manila basically drew inspiration from the 1840 *Proyecto de reglamento de carnes y reglamento interior de las casas matadero* from Spain´s metrópolis, Madrid. The Junta de Sanidad composed of medical practitioners worked closely with the

[16] Ibid., p. 5.
[17] Arleigh Ross Dela Cruz, ¨Epizootics and the Colonial Legacies of the United States in Philippine Veterinary Science,¨ *International Review of Environmental History,* vol. 2 (2016), accessed online.
[18] AHN, Ultramar, 4640, Exp. 9, Creación de arbitrios para construir un matadero en Santiago de Cuba, 1854.

engineers and architects of the Inspección General de Obras Públicas to ensure that public works projects adhere to the sanitation and environmental requisites of the time.

B. The Slaughterhouse Construction and Reform

Fish is the staple food of majority of the Filipinos. However, rapid urbanization and increase in population, the rise of the middle class and metropolitan mestizos,[19] and the changing attitudes towards food consumption in the nineteenth century may be attributed to the increase in meat consumption in the nineteenth century Philippines. By the nineteenth century, more cattle and hogs were slaughtered for public consumption especially in the colony´s capital. It was also during this time when reforms were instituted with regard infrastructures related to the capital´s food provisioning. The city government of Manila designed and carried out central plans for the construction of more modern public markets and slaughterhouses in the capital.

Figure 1: A photo of the *matadero municipal de Manila* from a postcard, circa late 19th century and early 20th century
(*unknown source*)

[19] Doeppers, (2016), p. 199.

The slaughterhouse infrastructure with all its corresponding characteristics related to sanitation and control was a nineteenth century European innovation.[20] This innovation however was not only limited to the European cities as technologies of slaughterhouses were eventually introduced by the metropoles to the colonies. In the first decades of the nineteenth century, the *Corregimiento de Manila* reported that there existed two functioning slaughterhouses in the capital, the slaughterhouse in Dulumbayan[21] in the suburb of Sta Cruz and another one in Arroceros located in the left side of the bank of the Pasig river. Xavier Huetz de Lemps documented the growth and evolution of Dulumbayan from a literal ¨*dulo ng bayan* or town periphery¨ to one of the growing urban settlements by the last decades of the nineteenth century. The area became a place for resettlement for Manila urban residents who had to locate for alternative dwelling place in the right side of the ban of the river. This agglomeration, naturally, caused some territorial conflicts and contestations.[22]

Given this account, it was not surprising then that the slaughterhouse, an industry considered to be unsanitary, was first situated in this city outskirt. However, as the century progressed, the colonial authorities recognizing that the Dulumbayan slaughterhouse had become a public health threat.

Despite the very limited extant records about these first slaughterhouses, data from the years 1814, 1818, and 1824 provide us with the state of meat consumption in the capital in the first decades of the nineteenth century as reflected in the official data of the city government. Meat from cattle and pigs were the two most consumed types. The table demonstrates that of the two slaughterhouses, the Dulumbayan slaughterhouse was bigger in terms of the number of cattle and pigs slaughtered. Between the two types of animals that were butchered in the slaughterhouses, there were more documented cases of cattle butchering. It can be surmised that this was because the colonial government paid more interest and importance to beef which was a commodity of the upper classes. Therefore, meat that came from cattle had to be inspected and monitored more closely than any other meat.

[20] Otter (2005), p. 30.
[21] Oftentimes, this was also refered to as ¨Dalumbayan¨ in archival documents.
[22] Xavier Huetz de Lemps, ¨L'inclusion conflictuelle dans les faubourgs de Manille d'une *hacienda* franciscaine (San Lázaro-Dulumbayan, 1860-1898),¨ in press.

Months	Year 1814		Year 1818		Year 1824	
	Number of Cattle Slaughtered	**Number of Pigs Slaughtered**	**Number of Cattle Slaughtered**	**Number of Pigs Slaughtered**	**Number of Cattle Slaughtered**	**Number of Pigs Slaughtered**
January	322	150	1155	302	1214	679
February	275	165	648	195	1069	772
March	353	120	856	234	706	559
April	1116	242	1258	348	681	883
May	1037	316	1188	407	1286	928
June	984	338	1105	479	1177	897
July	1050	296	1328	470	1171	831
August	1116	242	1405	497	1521	914
September	859	269	708	470	1555	922
October	1058	364	775	473	1443	916
November	862	282	725	477	1498	807
December	1010	251	1317	540	1426	982
TOTAL	**10042**	**3035**	**12468**	**4544**	**14747**	**10090**

Table 1: Number of Cattle and Pigs Slaughtered per Month in the years 1814, 1818, and 1824 in the Dulumbayan Slaughterhouse[23]
Source: Costelo, 2020. Elaborated by using the data from AF-BTNT-CCHS-CSIC, Mataderos, Microfim Rolls 7885 and 7886.

Months	Year 1814		Year 1818		Year 1824	
	Number of Cattle Slaughtered	**Number of Pigs Slaughtered**	**Number of Cattle Slaughtered**	**Number of Pigs Slaughtered**	**Number of Cattle Slaughtered**	**Number of Pigs Slaughtered**
January	29	124	44	548	no data	no data
February	65	506	0	392	no data	no data
March	89	455	0	504	no data	no data
April	0	701	0	613	no data	no data
May	57	643	0	644	no data	no data
June	42	585	2	657	no data	no data
July	0	600	0	686	no data	no data
August	0	703	0	792	no data	no data
September	0	687	1	1201	4	752
October	0	833	2	1160	1	755
November	0	819	1	1194	10	697
December	0	785	0	742	11	791
TOTAL	**282**	**7441**	**50**	**9133**	**Incomplete data**	**Incomplete data**

Table 2: Number of Cattle and Pigs Slaughtered per Month in the years 1814, 1818, and 1824 in the Arroceros Slaughterhouse

[23] AF-BTNT-CCHS-CSIC, Mataderos, Microfim Rolls 7885 and 7886, Carnicería de Dulumbayan, años de 1814, 1818, 1824.

Source: Costelo, 2020. Elaborated by using the data from AF-BTNT-CCHS-CSIC, Mataderos, Microfim Rolls 7885 and 7886.[24]

This data, of course, do not reflect the many cases of animal butchering in private slaughterhouses. This was the most typical practice before reforms were introduced in the slaughterhouse complex and tighter control and supervision was imposed by the colonial government. In official correspondences and government reports, the changing view of the slaughterhouse as an urban space and its relation to public health, sanitation and hygiene were compelling reasons to carry out urgent structural and administrative reforms in the slaughterhouse complex.

Before the construction of a centralized slaughterhouse, butchers killed animals in backyards, makeshift slaughterhouse or sheds situated in the midst of dense populations in the suburbs. Meat in this dispersed and decentralized manner was not freely inspected or worse was not inspected at all. For city officials and sanitary reformers, uninspected meat and other provisions could be detrimental to public health. In a correspondence of the *Gobierno Superior Civil* to the *Inspección General de Obras Públicas* and the *Junta de Sanidad*, the highest administrative office in the colony ordered the engineers and medical practitioners to carry out the much-needed structural and administrative reforms in the slaughterhouse since ¨without a doubt, [the state of butchering of animals in the colonial capital] is one of the main causes of the persistent and intense prevalence of the deadly viral epidemic¨ in the colony.[25]

To control animal slaughtering, structural, institutional and urban reforms had to be done. First, the Gobierno Superior Civil tasked the *Inspeccion General de Obras Públicas* to undertake the construction of a modern slaughterhouse with the close supervision from the *Junta de Sanidad*. Second, a specialized group of men with expertise such as veterinarians and slaughterhouse inspectors were appointed to play a central role in inspecting and scrutinizing the meat supply industry. Third, a public health code was promulgated in the form of the *Reglamento para el régimen interior de la casa matadero* that would ensure the tighter supervision and control in meat production and distribution.

The first discussions of constructing a modern abattoir in the capital began in the 1860´s. After a number of correspondences, the central colonial government in 1872 approved the construction of a new slaughterhouse to replace an old building located in the populous suburb

[24] AF-BTNT-CCHS-CSIC, Mataderos, Microfim Rolls 7885 and 7886, Carnicería de Arroceros años de 1814, 1818, 1824. Roll 7855 and 7866.
[25] AHN, Ultramar, 5320, Exp. 100, Expediente de construcción de un matadero en Manila, no. 3 Copia del expediente sobre construcción de una nueva casa matadero en esta capital, 1872.

of Santa Cruz that served as the capital´s primary slaughterhouse. In a letter of the *Gobierno Superior Civil* instructing the *Superintendencia de los Ramos de Propios y Arbitrios y Cajas de Comunidad* to approve the funding of the proposed new slaughterhouse, it highlighted the urgency of building a new structure for the butchering of animals since it was already a decade since the first plans of slaughterhouse were drafted. City officials claimed that the old slaughterhouse in Dulumbayan for the past years had been a constant threat to public salubrity (*salubridad pública*). The colonial government also emphasized that as the colony´s capital, it was an unquestionable necessity to provide Manila with a modern slaughterhouse that would represent the path of modernization of the archipelago.[26] The plan indicated that the new slaughterhouse will be constructed in the same compound where the *veedor* was located. The selection of the location of the new slaughterhouse opened debates among city officials and medical practitioners in the capital. Some city officials questioned the suitability of the location since ¨the *veedor* [pertaining to the meat inspection] was not only contiguous to the military quarters and the *Fábrica de Tabacos* but also San Miguel, a suburb to was significantly in the previous decades¨ They raised that determining the location of the new slaughterhouse should not only be a question of convenience but more importantly a matter hygiene in order to avoid the disastrous consequences in the future. These officials then named the *Junta de Sanidad* to play a major role in the evaluation of the hygienic conditions of the proposed sites for the building of the slaughterhouse.[27] These concerns were then addressed in a report on 13 April 1872 by the *Subdelegación de Medicina y Cirujía de Filipinas* through its delegate José Parejo del Valle. It stated that apart from ensuring that the new slaughterhouse would be a structure with sufficient capacity, good ventilation and of excellent sanitation condition, the city government´s main priority is to identify a location which is near or just beside the Pasig river. This will provide the water supply necessary in the day to day undertakings in the abattoir and to maintain its cleanliness which is of utmost important to a building of its nature. The *Subdelegación* opined that although the proposed site of the new slaughterhouse is near the cigar factory and the military barracks, this should not be a major reason for the non-approval of the location since proper cleaning, maintenance, and supervision should be adequate to prevent any sanitation problem.

[26] AHN, Ultramar, 5320, Exp. 100, Expediente de construcción de un matadero en Manila, No. 1, La Superintendencia de Propios y Arbitrios y Cajas de Comunidad de las Islas Filipinas en carta número 1212 fecha 17 de junio de 1872 remite copia del expediente instruido sobre construcción de una nueva casa matadero en Manila, 1872.

[27] Ultramar, 5320, Exp. 100, Expediente de construcción de un matadero en Manila, No. 3, Copia del expediente sobre construcción de una nueva casa matadero en esta capital, 1872.

Apart from its proximity to the river, the *Subdelegación* considered the proposed location an appropriate site because it is not within the populous suburbs in the right side of the river bank. The proposed site is separated by the river from the bustling suburbs of Quiapo (especially to the Quinta Market) and Santa Cruz and yet it has a considerable distance from Intramuros and the important suburb of Binondo. The city government did not consider as a serious concern the proximity of the slaughterhouse to the other neighborhoods in the left side of the river since these consisted of the ¨lesser important ¨ *pueblos* of Paco, Malate and Ermita. However, it pointed out that perhaps a serious matter that should be addressed is the site´s elevation since inundation is experienced by the *Fábrica de Cigarros* almost annually. *Cigarreras* entering the factory with water up to their knees or even having to use the *banca* to navigate the area were typical scenes in the area. The Arroceros slaughterhouse is located on the left bank of the Pasig river.[28] Population data of the time document that bustling suburbs were located on the other side of the river. To improve the communication and transportation of meat, a small dock was constructed on the side of the slaughterhouse close to the river.

Structural and spatial design: The Arroceros slaughterhouse

The slaughterhouse is regarded as a nineteenth century modern innovation to improve not only the conditions of butchering but also of public health and environmental sanitation. A slaughterhouse is a ¨structure built with the explicit and sole purpose of killing animals and dressing the carcass¨.[29] This structure and the mechanisms that revolve around it, as Otter puts, ¨offers the historian a lens through which to examine the conjoined histories of civilization, commodification, and cleanliness. ¨[30] In Europe and in Spain, ideas of slaughterhouse reform were tantamount to public hygiene reform. In the Philippines, the construction of a slaughterhouse arguably opened a wider debate on the issues of public health and hygiene in the colony´s capital in the second half of the nineteenth century. For instance, medical officers mainly those that represent the *Subdelegeción de Medicina y Cirujía de Filipinas* insisted that the planned new slaughterhouse should consider the hygienic conditions of a rapidly urbanizing city.[31] Ideas of public health, sanitation control, and the need to introduce modern infrastructures resonated in the many correspondences of colonial and city administrators,

[28] Ibid.
[29] Otter, 29.
[30] Ibid, 30.
[31] AHN, Ultramar, 521, Exp. 6, Aprobación de proyectos de ampliación y reforma del Matadero de Manila, 1878.

sanitary officials, urban reformers, and technological experts. The medical practitioners in the capital highlighted that proximity to water source, land elevation, and distance from populated barrios were some factors that should be strictly considered in identifying the location of the new slaughterhouse. In terms of design, the new slaughterhouse should be a modern complex of structures that meet requirements of the sanitary measures of water supply, drainage and sewage, waste collection, light and ventilation. Given these factors, architect Antonio Ulloa with the approval of Manuel Ramírez Bazán, inspector general of the *Inspección General de Obras Públicas de Filipinas,* which was tasked to undertake public works projects presented a plan of a slaughterhouse with water facilities, amenities for the cleaning, storage, and inspection of meat, washroom, and sewage. Indeed, architectural practice was influenced by the period´s hygienic and public health ideals, and a growing group of technical experts and sanitary professionals who began taking active roles in placing these ideas on the public agenda.

The slaughterhouse is ¨a consciously engineered complex¨ that consisted mainly of elements such as yards, pens, slaughterhall, dressing room and suspension room, waste management facilities, administrative blocks and workers' area. Towards the 20th century, refrigeration chambers will be added to the slaughterhouse complex. According to Otter, the slaughterhouse complex can be characterized by a flowchart wherein a ¨series of functionally distinct and sequential stages¨ are followed. [32] This is in stark difference with the unregulated animal butchering where animals were kept, killed, and partitioned in uncontrolled space. This idea of a ¨flowchart¨ is actually mirrored once we examine the blueprint of the Manila slaughterhouse complex.

[32] Otter (2005), pp. 38-39.

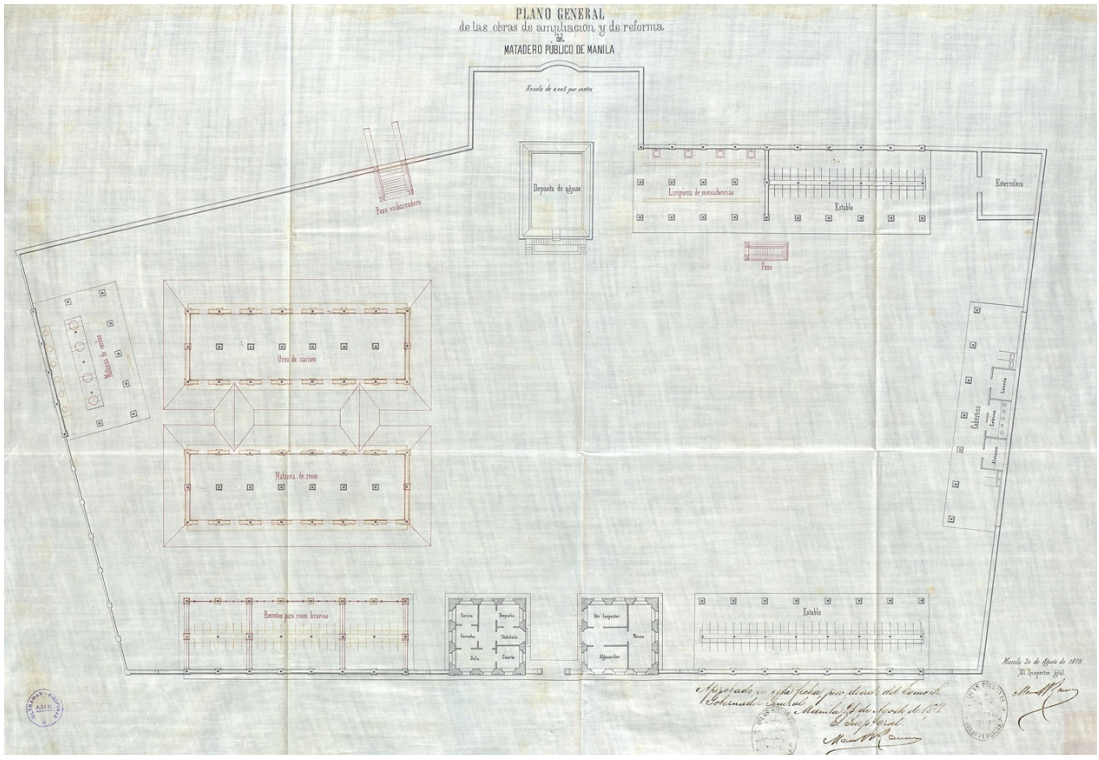


Figure 2: The plan for the new slaughterhouse of Manila in Arroceros
Source: AHN, Ultramar, MPD. 5406[33]

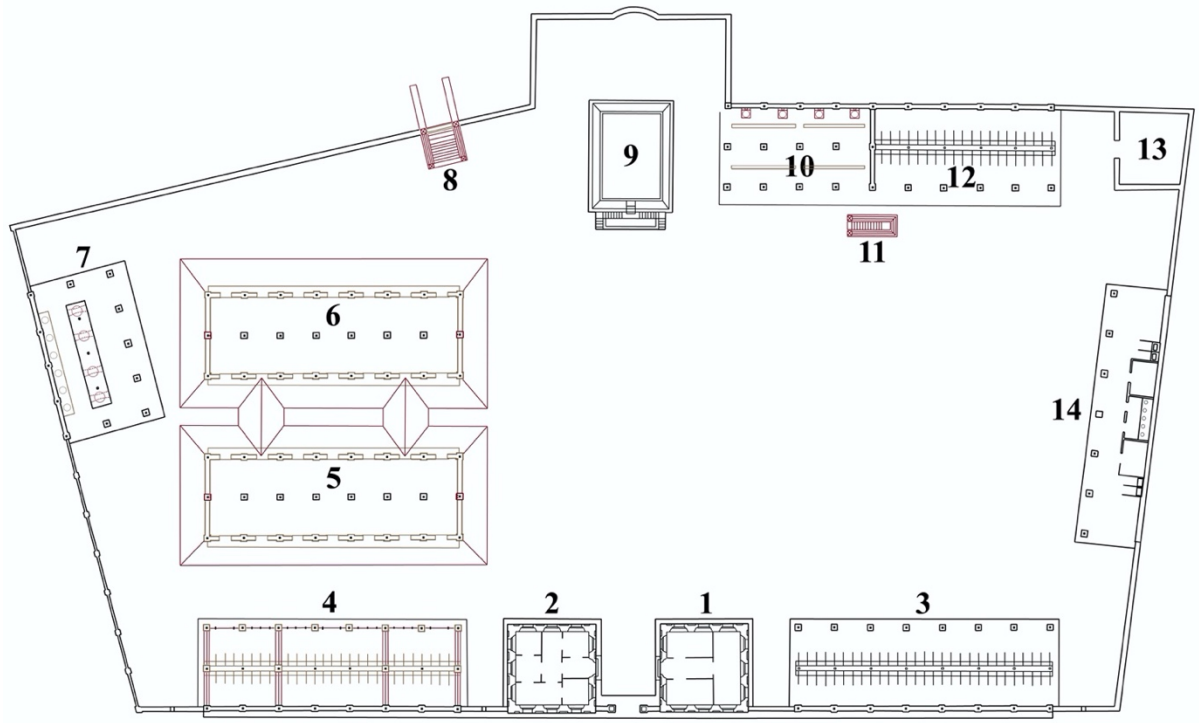


Figure 2.1: Reconstructed plan of Figure 2 from AHN, Ultramar, MPD. 5406
Costelo, 2020

LEGEND

1 – Oficina del inspector, mozos y alguaciles

2 – Despacho, cocina, comedor, sala

[33] Ultramar, MPD. 5406, Plano general de las obras de ampliación y de reforma del matadero público de Manila.

3 – Establo
5 – Matanza de reses
7 – Matanza de cerdos
9 – Depósito de aguas
11 – Pozo
13 – Estercolero

4 – Recinto para reses bravías
6 – Oreo de carnes
8 – Pozo embarcadero
10 – Limpieza de menudencias
12 – Establo
14 – Cobertizo con almacén, letrinas y leñera

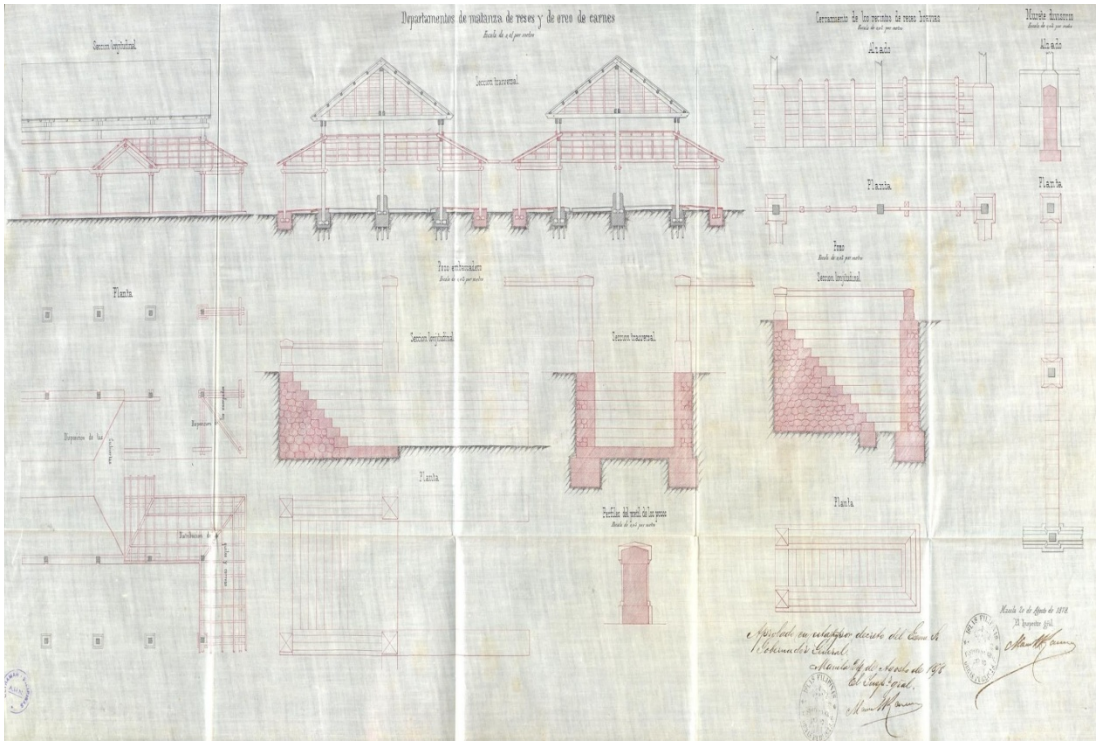


Figure 3: The slaughterhouse area where animals were butchered and meat was ventilated. *Source:* AHN, Ultramar, MPD., 5407[34]

[34] AHN, Ultramar, MPD. 5407, Departamento de matanza de reses y oreo de carnes: Ampliación y reforma del Matadero público de Manila.

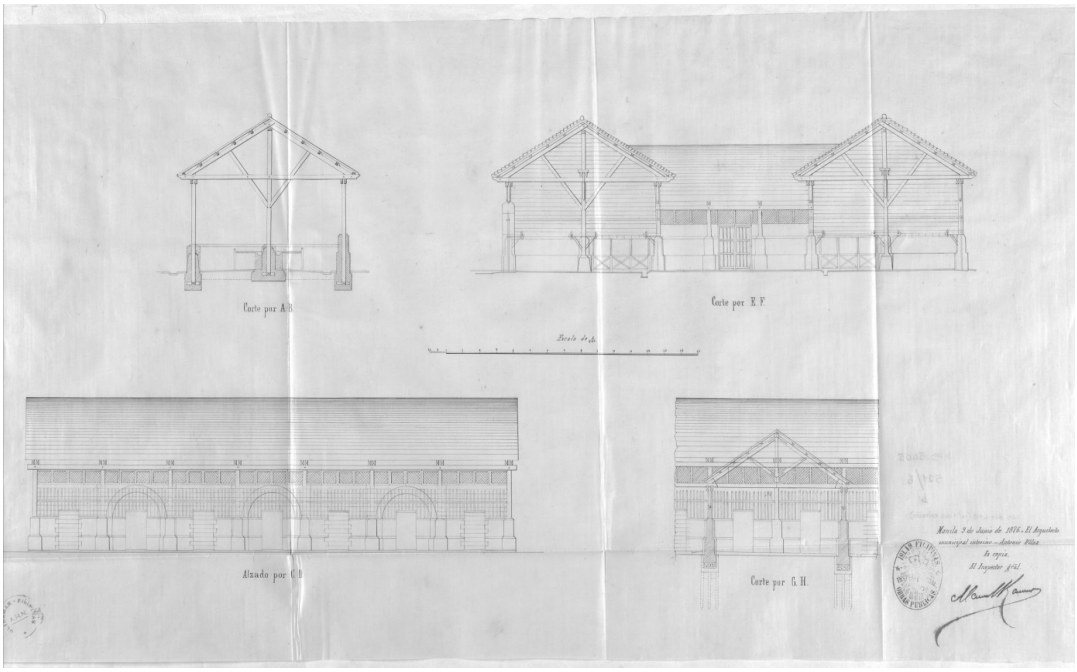


Figure 4: Plan for the structure´s elevation
Source: AHN, Ultramar, MPD. 5405[35]

The slaughterhouse complex designed by the IGOP as shown in Figure 2 consisted of 9 structures. The position of the structures and the design of the complex was imagined, planned, and constructed within the ideas of sanitation, order, inspection, and control. Two buildings (*oficina del veterinariario inspector, alguaciles, mozos*) served as the offices for the slaughterhouse inspector, veterinarian inspector, and slaughterhouse guards. Windows overlooking the rest of the structures within the slaughterhouse complex were typical additions to the offices´ design which facilitated the inspector´s need to have a full view of all the activities in the compound. The central and dominant location of these structures within the compound (as seen in Figure 1) mirrored the centrality of the role of inspection and control within the complex. Scholars have argued that the positioning of the superintendent´s office above and between the animal stables and the slaughterhall is a symbolic representation of the ¨scientific inspection¨ that permitted the officers to monitor, supervise, and inspect the non-human and human movements and activities in the complex. As soon as animals entered the slaughterhouse complex, they were led directly to the three buildings that functioned as stables and pigpens. The stables can contain 150 cattle while the pigpen can hold 100 pigs. Animals awaiting slaughter were kept in these pens. The construction of sewage in the pens were necessary to keep the chambers free from animal waste. One of the characteristics of the

[35] AHN, Ultramar, MPD. 5405, Proyecto de obras en el Matadero público de Arroceros en Manila: Cortes y alzado.

slaughterhouse design was that the stables were structures separate from the buildings where actual butchering took place.[36] This design perhaps reflects the prevailing discourse of the time wherein ¨animals awaiting slaughter should be spared as far as possible from any contact with the sights or smells of the slaughterhouse itself¨[37].

Then a separate designated area (*matanza de reses/matanza de cerdos*) is provided for the specific act of animal slaughtering (see Figure 3). For the city administrators, the designation of specialized areas for specific stages in the slaughterhouse is a feature of the structure´s modernity, a stark contrast from the traditional practice where the killing, cleaning, and preparing of animal meat all took place in a single, unsanitary, and unregulated space. Animal butchering was performed in three buildings of the compound. Cattle slaughtering was separated from pig slaughtering; two structures for cattle and livestock and one for swine.

According to the city officials and the architect of Manila, the design of the new slaughterhouse especially the structure intended for animal butchering is characterized by the established new studies and debates about the ideal architectural and structural layout of a modern abattoir. A major difference of this slaughterhouse is the construction of suspended hooks and rails where animal meat is hoisted for proper ventilation, cleaning, and inspection. The installation of these longitudinal rows of hooks and rails was a simple addition to the slaughterhouse complex and yet it spelled a significant difference in the improvement of hygiene in the handling of meat. Sanitary reformers of the city complained about the terrible meat handling in unregulated animal butchering especially the typical practice of cutting meat on the bare floor. In the new slaughterhouse, granite stone was utilized in the pavements of the galley. The engineers of the IGOP upon reviewing the plan insisted that aside from granite slabs, no other material should be used because this is the only material that does not absorb the blood coming from the killed animals. This followed the Western ideas of nineteenth century abattoirs wherein impervious materials were utilized in slaughterhouse construction.[38]

A separate structure (*oreo de carnes*) was intended for the ventilation, cooling, and storage of the animal meat. Like in the main slaughterhall, hooks and rails were installed for animal meat to be hanged and be visible on all sides which facilitated meat examination. The last part of the compound (*limpieza de menudencias*) was designated for the cleaning of the viscera and other internal parts of the animal, management of animal waste and manure and

[36] AHN, Ultramar, 521, Exp. 6, Aprobación de proyectos de ampliación y reforma del Matadero de Manila, 1878.
[37] R. Stephen Ayling, *Public Abattoir Their Planning, Design and Equipment* (London: E & F.F. Spon Limited, 1908), p. 41.
[38] Otter (2005), p. 9.

other sanitation infrastructures such water well and tank, and warehouses. Here, an enclosed area (called *estercolero*) was constructed intended for the management of animal manure and all other kinds of waste. Otter emphasizes that one of the characteristics of modern abattoirs was the ¨clinical division of what was ¨meat¨ and what was considered ¨waste¨.[39] The presence of an area specifically intended for the washing and disinfection of the animal internal parts was an extension of the slaughterhouse´s role of examining and identifying what was harmless and detrimental for human consumption. In this area, blood, hides, innards, and glands were subjected to inspection and examination. This was very important since Filipinos include innards and animal blood as part of their dietary options.

Moreover, one of the most important services that should always be present in the slaughterhouse is water source. Water supply (*depósito de agua y pozo*) was made possible by pumping water from the river to the water tank in the slaughterhouse complex. In one of the reform projects of the slaughterhouse, the construction of a deep well was recommended wherein water would be filtered to provide clean and sufficient water supply to all the buildings inside the complex, most especially in the cleaning of animal meat. The vitality of the water supply system could not be stressed enough by the IGOP officials behind the public works project. Very detailed plans were laid out as seen in this report:

> ¨The hydraulic service with respect to the water´s elevation to the water tank and the mechanism on how to conduct water to the pipes should be considered. There are 12 taps that have been dispersed in the various departments of the slaughterhouses. The water pump, when set in motion, has a corresponding speed of 5.42 revolutions per minute. It takes 8 hours and 22 minutes to fill the water tank whose capacity is 215 cubic meters. All water pipes should be in proper running condition, should be examined regularly so that all taps are functioning and without defect whatever the order in which the taps are opened. Each faucet should have an average flow of 62 millionths *(millonésimas)* of cubic meter per second. In this way, it will take 9 hours and 30 minutes to consume the 215 cubic meter capacity of the water storage as distributed in the 12 taps in the slaughterhouse.[40]

When the potable waterworks project was inaugurated in 1882, reconfigurations in the pipelines were done to ensure that pipes run through important structures such as the slaughterhouse.[41]

[39] Ibid., p. 41.
[40] AHN, Ultramar, 5320, Exp. 100, Expediente de construcción de un matadero en Manila, No.11, Copia del expediente sobre reforma de los arbitrios de matanza y limpieza de reses y aprovechamiento de pieles, Manila, 17 de junio de 1872.
[41] AHN, Ultramar, 492, Exp. 2, Informe del Inspector General Ramírez Bazán, Manila, 29 de mayo de 1884.

For city officials, it was vital to establish systems of sanitation since the slaughterhouse in this epoch was considered an epicenter of disease. Despite all these improvements and reforms, a deeper analysis of the structure still reveals the many structural limitation of the slaughterhouse. The most glaring limitation perhaps was the compound´s design and system for water supply. The complex relied heavily on the adjacent Pasig river for water supply and this spelled a serious sanitation problem because almost all sewage pipes at this time all lead to the same river. In the nineteenth century, water from the Pasig river was very unsafe for drinking and for cleaning food.

Institutional policies: Specialized men in the slaughterhouse complex

Reforms were not only exclusive to the physical attributes of the slaughterhouse. An equally vital reform was the improvement of the composition of men that work in the compound. City officials envisioned not only of suitable and structurally-sound buildings but also of having men of knowledge, expertise, and integrity as inspectors and supervisors as well as of having well-trained and well-behaved men as slaughterers or butchers. These men were expected to observe a standard set behavior with respect the performance of their duties in the slaughterhouse complex affirming the idea that slaughterhouses are ¨ideal sites for the establishment and exercise of sanitary discipline[42]¨. Out of the four chapters of the *Reglamento para el régimen interior de la casa matadero,* three chapters codified the duties, responsibilities, and the accepted conduct and decorum of all individuals working in the abattoir from the inspectors to the ordinary butcher.[43]

The meat inspector is one of the most if not the most important personnel in the slaughterhouse complex. In the first half of the nineteenth century, sanitary reformers criticized the practice of assigning the task of meat inspection to men whose only qualification was their familiarity with animals for being a stockbreeder. Before the centralization and modernization of the slaughterhouse in the colonial capital, ¨overseers¨ (*veedores*) were the only representation of inspection and control in the slaughterhouse environment. These men however did not necessarily possess the training in sanitary science, specifically in veterinary medicine that was very much needed in animal and animal meat inspection. With the reforms in slaughterhouse

[42] Otter (2005, p. 34.
[43] *Reglamento para el régimen interior de la casa matadero* en *Disposiciones sobre policía urbana, ornato y demás servicios dictadas por el Corregimiento de Manila.* (Manila: Establecimiento Tipográfico Amigos del País, 1867), p. 33-44.

technology in the mid-nineteenth century, veterinarians who served as meat inspectors became visible representations of modern health under the Spanish colonial administration. Meat inspectors, city officials insisted, should be men of capability who are knowledgeable of diseases, their origin and how these diseases disrupt the qualities of good meat. For an inspector to acquire this, it was necessary for him to know the complex composition of animal parts and organs, their functions, and all the possible injuries of animals that are slaughtered for public consumption. Without the basic and primary formation of the inspector, it would be impossible to distinguish and characterize diseases if they are enzootics, epizootics, contagious or non-contagious.[44] Due to the complexity and highly-specialized nature of the duties of a meat inspector, sanitary reformers asserted that the task be primarily given to veterinarian and, if not available, to health specialists and/or medical doctors. They argued that public health is heavily dependent on this service of determining, separating, and obstructing any infection or form of corruption that could harm the quality of the meat and food supply in general.

In the case of the Philippines, the slaughterhouses made visible the once-obscure persona of the veterinarian. The colonial government emphasized that veterinarians should be the ones responsible in the ¨the surveillance of the sanitary policies of markets, slaughterhouses and in general, the salubrity of food and beverages and the inspection of live or dead meat¨ as stated in the *Reglamento de inspección de carnes* implemented on 25 February 1859 in Madrid and the Royal Order of 8 March 1865 which took effect also in the colonies. In the Philippines, veterinarians had to assert their presence so that they be recognized as the most appropriate and capable individuals to perform the task since this was formerly dominated by health practitioners due to the absence or limited number of veterinarians in the earlier decades. This was the case of Don Eugenio Martínez who had to assert his right to be appointed as the city´s meat inspector. [45] The growing concern on securing the quality of the people´s provisioning was echoed by the veterinarian Don Baldomero Solsona, in a letter addressed to the Governor General of the islands. He cited the urgent need of appointing veterinarians that would examine the people´s food sources such as livestock and fish supplies. While it was true that fish remain the most basic provisioning of the people, he cited that there was an urgency to appoint veterinarians because of the ¨pressing need due to the number of animals that destined for public consumption every day in the capital. ¨[46]

[44] Caballero, 45-48.
[45] AHN, Ultramar, 547, Exp. 7, Recurso sobre preferencia de los veterinarios para el cargo de inspector de carnes en Filipinas, 1896-1897.
[46] AF-BTNT-CCHS-CSIC, Veterinarios, Microfilm Roll 7455, Carta de Baldomero Solsona al Gobernador General de estas Islas, Batangas, 10 de febrero de 1878.

The city government of Manila attempted to standardize and codify the responsibilities and specific tasks of the slaughterhouse veterinarian meat inspectors. The meat inspector is required to follow a strict routine to ensure that only meat and food supply of good quality and in perfect sanitary condition could leave the slaughterhouse complex to be distributed and sold in markets for public consumption. His role begins the moment an animal enters the slaughterhouse. Every day at 5:00 in the afternoon, the veterinarian inspects all animals that will be slaughtered for that night. A thorough inspection of the animal intended for slaughter is done immediately to prevent any form of contagion in case the animal is infected. He officially determines if the animal has passed all the requirements for slaughter. If the animal is found to be infected or to be a carrier of an infectious disease, the inspector is expected to order the immediate burning of the beast. An animal that died because of wounds incurred during transport or during its stay in the slaughterhouse complex, may be sold only after the veterinarian inspector´s assessment. No animal, most especially cattle, that is found to be carrying an offspring could be butchered. The veterinarian reports the health conditions of all animals awaiting slaughter to the abattoir administrator who will facilitate the undertaking of the next procedures related to the act of butchering. A second round of inspection is done on all animal meat and reports the condition to the slaughterhouse administrator. Animal carcasses are hanged in the ventilation hall for the meat inspector´s analysis. The fitness of the meat is once again determined, this time through a scrutiny of the state of the animal´s viscera. The meat inspector is expected to inform the slaughterhouse administrator any cause of concern for possible infection inside the complex, most especially in the proper removal and disposal of corrupted meat from infected animals. If asked, they provide certifications as to the safety of the meat.

Furthermore, the meat inspectors´ role is not only limited within the bounds of the slaughterhouse complex and the regulation of meat production. They are also expected and authorized to report to the competent authority all the meat, fish, and any other food supply sold in public markets and other public spaces that are not fit for common consumption.[47] Archival documents reveal the many attempts to increase the compensation of veterinarians in Manila. One of the earliest record was in 1862 when Madrid approved the monthly compensation of Manila veterinarian inspectors to 60 pesos from 25 pesos ¨ not only to prevent the temptations from other parties that would try to persuade the veterinarian to commit fraud but also to compensate the tiring inspection routine of having to exert a continuous and painful

[47] *Reglamento para el régimen interior de la casa matadero*, pp. 45-48.

surveillance in the course of the night to ensure that the quality of animal meat meets the necessary conditions for the interest and health of the public."[48]

Aside from the inspector veterinarian, the slaughterhouse administrator played an important role in the management of the abattoir. Slaughterhouses, just like cemeteries, were attributed to be sources of diseases. Utmost vigilance and supervision is necessary to keep this infrastructure sanitary, regulated, and structured. This function is entrusted to the slaughterhouse administrator who was in charged in keeping the abattoir in order as a sanitary space where human and animal activities are connected. The administrator´s over-all job was to establish hygiene and sanitation, order, and control in the slaughterhouse through preservation of the internal order of the establishment and the observance of any provisions adopted by the city council of Manila. His most basic role is to ensure that no suspicious animal be allowed entry nor stay in the slaughterhouse complex and that individuals transporting the animals for slaughter be able to provide reliable documents that show the animals´ safe provenance. He is also in-charge in the proper safekeeping and maintenance of all tools and utensils used in animal butchering. It was very important that slaughterhouses and market places be spaces of tight control, order and good conduct. Therefore, it was the administrator´s responsibility to maintain oversight on the different actors in the slaughterhouse most especially the stockbreeders and animal suppliers, animal butchers, and meat loaders.

Animal movement was not only thing that was documented, inspected and controlled in the abattoir. The butchers or the *matarifes* who were assigned to perform the dirty such as butchering, cleaning, and chopping animal meat were also subject to strict documentation, inspection, and control. Like the animals, the butchers were numbered and documented. The city government ordered the creation of a guild *(gremio)* of butchers in the capital. The butcher´s identification was very important for the government to monitor his proper conduct. All butchers should be properly documented (*empadronado)*. While performing their job, they were required to wear their metal badges that contain their registration number *(número de empadronamiento)*. The records should reflect the butcher´s identification, his exact place of residence, and most importantly annotations of his behavior and conduct.[49] Only licensed butchers could undertake the task of animal slaughtering. Like everyone else in the slaughterhouse complex, the butchers follow a specific routine in the performance of their task. The butchers´ work is mostly concentrated at night, beginning at midnight wherein they were expected to prepare the necessary tools required in animal slaughtering. The act of killing the

[48] AHN, Ultramar, 5176, Exp. 65, Gratificación para veterinario del matadero de Dulumbayan, 1860-1862.
[49] *Reglamento para el régimen interior de la casa matadero*, p. 40.

animals and cleaning the meat begins several hours after midnight until dawn. When the task is finished, all butchering materials should be returned to the inspector´s and administrator´s office.[50]

The specialized men that ran the slaughterhouse complex brought changes in the attitude and practices toward techniques of animal slaughtering. Human behavior and practices towards animal buthering was also controlled. Most of the literature that deal with animal butchers or *¨matarifes¨* depict them as ¨demoralised brutes¨[51]. A butcher was typically portrayed as a ¨drunkard¨ since ¨a man full of beer often does the [butchering] work¨[52]. The violence that was associated to the slaughterhouse complex and the performers of animal slaughtering perhaps were the key factors in this vilified image of the urban space and the butchers. However, the regulations that the authorities laid out for the observance of the men in the slaughterhouse complex point to the contrary. Norms and limitations were set especially with regard the butchers´ treatment of animals and even the butchers´ behavior and conduct. For instance, drunk butchers and brawlers are strictly prohibited within the complex. To maintain peace and order, security guards (*alguaciles celadores*) were employed in the slaughterhouse complex. [53]Butchers were required to be dressed in clean and appropriate clothes to carry out their tasks. Proper handling of the animals should be observed, avoiding any form of maltreatment, torture, harm or abuse to animals. To prevent inflicting added suffering, only butchering instruments approved by the administrator and veterinarian could be used. The butchers should also ensure that animal is in complete rest. Non-compliance to these rules meant the suspension or expulsion of the butchers in the slaughterhouse.[54]

C. Public Markets Construction and Reforms

In the nineteenth century, city officials realized more than ever the urgent need for the capital to be dotted with well-planned and well-built markets. City officials reported that for the past decades, residents of the capital did not have many options than to buy their necessities in ¨repulsive and unhealthy-looking¨ shops. This situation is worsened by the fact that these shops were always hidden from the city´s supervision and regulation. Urban administrators added that these shops were so dispersed and oftentimes ambulatory in character that it was

[50] Ibid., p. 41.
[51] Otter (2005) p. 33.
[52] Ayling (1908), p. 2.
[53] Ultramar, 5173, Exp.17, Creadas plazas de alguaciles y celadores de matadero, 1859.
[54] *Reglamento para el régimen interior de la casa matadero*, pp. 40-41.

almost impossible for the government to control them. Due to lack of regulation, these shops were reported to sell products that were detrimental to the population´s health and well-being. It was clear to the city government that there was a serious demand for the construction of new markets in Binondo and Tondo due to the suburbs´ increasing population and importance in the economic activities of the capital. Officials noted the growing number of residents in these areas not only among natives but of Europeans and mixed races as well.[55]

In the mid-nineteenth century, two of the biggest public markets in the capital were constructed and reformed. This part discusses the construction and development of the two public markets projects in this period- Divisoria and Quinta. These were two of the most important markets in the capital because of their capacity and they served the bustling suburbs of the city. The Divisoria market got its name precisely because of its location in the border (*divisoria*) of Binondo and Tondo. The planners and city administrators provided two main reasons in choosing the location. First, the market´s proximity to the Binondo estuary (*estero*) is believed to be advantageous for the easier transportation of food and market supplies. However, city officials did not deny the worsening state of the tributary. According to them, it is imperative to clean the estuary and reestablish navigation which once had communication up to Malabon. Second, the vicinity is in a booming commercial location and growing movement of people and goods, especially in the street of Santo Cristo and its nearby thoroughfares.[56]

On the other hand, the Quinta market located near the Puente de Colgante serviced the growing suburb in Quiapo. On 23 Abril 1856 funds for the construction of the said market was approved amounting 41,900 pesos. A big part of the amount was used to acquire land in the identified location near Puente de Colgante.[57] The market, since it was close enough to the Arroceros slaughterhouse, became the first loading point of animal meat slaughtered in the city´s abattoir on the other side of the river. The accessibility and proximity of markets to slaughterhouses was encouraged to allow the easier transportation of meat to the city just like the case San Lucas slaughterhouse in Mexico City.[58]

[55] AHN, Ultramar, 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo.
[56] Ibid.
[57] AHN, Ultramar, 5266, Exp. 4, Creditos para Quinta.
[58] Jeffrey M. Pilcher, ¨Abattoir or Packinghouse? A Bloody Industrial Dilemma in Mexico City, c. 1890,¨ *Food and History,* vol. 3, no. 2 (2005), p. 124.

Structural and spatial design: The Divisoria and Quinta public markets

The blueprints of the Divisoria and Quinta market did not have significant differences in terms of design and materials. An examination of the markets´ plans and blueprints reveals the city officials and technical experts' preoccupation of infrastructures with structural elements and facilities for sanitation, organization, and order. Just like in the slaughterhouse plans, the public markets architectural and spatial designs reflect the changing norms and attitudes towards food safety and hygiene. According to Don Diego Viña, architect of the Divisoria Market, the design should envision ¨a public market for the rich and the poor¨ and ¨a structure that is adapted to the conveniences, customs, and necessities of the city that incorporate the most advantageous conditions of the new developments in the field of construction¨[59]. Indigenous wood such as *molave* and *bancal,* known for their resistance and durability, were used in the windows and doors, *yakal, guijo and dongon* for the frames while *banaba* wood was utilized for the floors. Windows were made of local shells. Rocks and stones from the quarries of Guadalupe in San Pedro de Macati, Meycauayan in Bulacan and Mariveles in Bataan were used to erect the masonry walls and the floors.[60]

The first proposals for the two markets were actually deemed inferior because the designs and plans, according to the architect´s technical evaluation, lacked the proper amenities for the purpose and did not possess durability and beauty. The architect singled out one very specific weakness of the designs. Instead of being a sanitation solution, the latrines in the markets emit awful smell which almost infect the whole market due to their poor locations. It became then an important aspect of the markets' design to incorporate aspects of hygiene and cleanliness as well as order and physical beauty.[61]

Water Supply and Sewage System

According to Manila´s hygiene reformists which oftentimes comprise the city architect, engineers, and medical practitioners, sufficient supply of clean water is a must in the marketplace and its vicinity. To ensure the cleanliness of the gallery, it was emphasized that hand water pumps and water buckets should always be accessible. The plan for the Divisoria

[59] AHN, Ultramar, 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo. Informe de Don Diego Viña.
[60] AHN. Ultramar, 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo, Reconocimiento del director de obras públicas y del señor alcalde 1º de Tondo.
[61] Ibid.

Market was revised in 1853 to incorporate the construction of two water tanks in the courtyard of the market. One water tank was used for the storage of potable water while the other tank was filled with water from the estuary to be used for common purposes. A pumping machine was to be installed in order to drive water from the estuary to a small channel leading to the tank.[62]

One important aspect in the general plan for the renovation of public markets was the construction and reconstruction of the sewage system within the marketplace. Used water in the market went through channels made of cast iron. These prevented the stocking up of filthy water in the patios of the markets. The channels were covered with grills to maintain the sanitation of the premises. Then the channels were conducted to the general sewers that ultimately end in the Pasig River. In the case of the Quinta Market, 2,888 pesos were allotted for the covered pipes that served as sewers in the market.[63]

The market was not only a convergence point for trade but was almost home to many; to the merchants, the food suppliers, the loaders (cargadores) and to almost any person who engage or is part of commerce. The market´s design made room for shops where not only goods were sold but at the same time where merchants also slept, cooked, and spent their daily lives. Given this context, it was very important to ensure that proper waste disposal of all types including human waste, was put in place. Therefore, putting up latrines and urinals were not only necessary but obligatory in a crowded space such as the public market. From the beginning, the Divisoria market already had latrines. However, grievance from storeowners and ordinary folks reached the officials. The latrines that were situated in two small rooms inside the building did not possess good sewage system. They complained about the drainage pipes leading to the estuary that constantly produce an intolerable bad smell. The people were worried about the possible adverse effects of this situation to the people´s health and its effect to the food supplies in the market. On May 1862, Governor General Lemery wrote to the municipal architect to act upon the urgent need of removing and relocating the latrines and improving the sewage system of the market.[64] As a result, the latrines were moved to the extreme lateral areas of the building, the area closest to the estuary. The architect´s plan which amounted to 290 pesos of budget included the reforms in the proper inclination of the pipelines and the construction of thick walls and elevated floorings to prevent the emission of odors and facilitate

[62] AHN, Ultramar, 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo.
[63] AHN, Ultramar, 5176, Exp. 6, Construcción de galería en el mercado de Quiapo, Manila, 1859-1860.
[64] AHN, Ultramar, 5187, Exp. 26, Autorizan venta de terrenos por subasta en Quiapo, 1862

the easy cleaning of the toilets.[65] The latrines were constructed near the estuary with sewers leading to the body of water. According to the plan, the sewers must end far from the loading dock so that the contaminated water and all its impurities would not be detrimental for the people that would disembark nor the goods that would be offloaded in the area. Rainwater will be used to supply the latrines with water so as to maintain cleanliness and avoid the emission of stench odor.[66] The Divisoria market assigned separate latrines for males and females.

Furthermore, the reconstructions also included the reforms in the market´s pavement. For instance, reports of the presence of quagmire in the marketplace especially during the rainy season became a serious concern for the city´s officials which led to the carrying out of additional reforms for the markets. According to the report, some patios of the Divisoria market lacked tiled flooring. As a result, the patios are converted to swampy yards where it became quite impossible for the people´s convenient circulation. Moreover, complaints about the emission of bad odor in the fish section of the market were also recorded. The sanitation officials who inspected the market reported that dirty and odorous waters proceeding from the fish market normally spilled over outside the sewage system. In order to solve this problem, reforms were carried out to improve the pavement of the marketplace ¨to not only improve the appearance of the structure but also the marketplace´s sanitation and hygiene to avoid the stench and discomfort coming from the stagnant water.[67]

However, while it is true that there were attempts to lay out and improve the sewerage system of the capital, this system however added to the pollutants of the Pasig River. This was a problem since until the end of the nineteenth century, many inhabitants in the capital still relied on the river as one of the principal and most accessible sources of water. However, as shown in the previous chapter, this only proved dangerous to the city´s public health as the river became more contaminated.

Ventilation, Circulation, and Organization

Ventilation and sufficient air circulation was also primarily considered in the construction of the galleries and patios of the market. The exterior galleries were constructed

[65] AHN, Ultramar, 5188, Exp. 59, Autorizando el gasto de 190 pesos para la construcción de dos letrinas en el mercado de Tondo y Binondo.
[66] AHN, Ultramar, 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo.
[67] AHN, Ultramar, 5191, Exp. 16, Aprobado gasto para obras en un mercado de Manila, 1862.

in a way that would impede the entry of too much sunlight and rainwater but would not oppose the free movement of fresh air.[68] In the case of the Quinta market, the original plan for the market´s patios had to be revised in order to construct bigger and wider patios. City officials emphasized that these patios would not only facilitate the easy unloading of market products but more importantly would also contribute in the good ventilation and maintenance of hygiene. The tropical climate and the exposure of food supplies to constant heat and rain was a concern for public health officials. According to the city´s sanitation officials and engineers, sheds, platforms and stands were urgent necessities of the urban markets because food spoilage is at risk ¨in a country that is primarily characterized by heat and rain¨. As a response, sheds (*tinglados*) were constructed in the different small and big markets in the colonial capital. Such was the case when reconstructions were made in 1889 in the small market of Sta Cruz in the corner of Calle Misericordia[69] and in the Intramuros market located in the southern wharf of the Pasig River[70]. The tables especially used for cutting and displaying meat were to be made of marble because this material is easy to be maintained clean. Meanwhile the tables for the fish, aside from being made up marble, had to be slightly inclined to maintain freshness.[71]

To facilitate organization and order, large patios and bigger galleries characterized the new markets of the capital.[72] . Special attention should be given to the meat and fish sections because these always emit an unpleasant smell. For them, the meat and fish section should be isolated in the spot of the market where water supply is abundant. In this case, the stench that these foodstuffs emit is not transmitted to any point and does not prejudice those who inhabit the shops in the market nor the neighboring streets and population. For the Divisoria market, the meat and fish section were placed in a separate part of the market in a covered gallery composed of two lounges (one for each section) near the side of river. Easy circulation of peoples and goods was an essential consideration in the architect´s plan especially with the growing number of streets stalls in the market. The stalls´ location and organization were regulated with standardized dimensions and spaces. The city officials demanded that the architect´s lay-out with respect to the location of the stalls and shops be observed to allow the

[68] AHN, Ultramar, 501, Exp. 5, Aprobación del proyecto de construcción de un mercado en el arrabal de Santa Cruz de Manila, 1889.
[69] Ibid.
[70] AHN, Ultramar, 501, Exp. 6, Aprobación del proyecto de construcción de un mercado intramuros en Manila, 1889.
[71] AHN, Ultramar, 502, Exp. 3, Aprobación del proyecto de reconstrucción del mercado de la Divisoria de Manila, 1889-1890.
[72] AHN, Ultramar, 5176, Exp. 6, Construcción de galería en el mercado de Quiapo, Manila, 1859-1860.

easier classification of the stores and their effective inspection and vigilance. For the goods to properly fit with enough room for movement, the stalls were allotted 1 ½ to 2 square yards.

The market´s plan did not only cover the sanitation concerns of a sanitary infrastructure. Part of the design for sanitation and hygiene was its beautification efforts through the planting of trees in the patios and the surrounding areas of the market. The trees would not only serve as ornament and add aesthetic quality but would also serve as shade in the area especially during the dry season.[73] To provide accessible water in the complex, water tanks were placed in the patios or courtyard of the market.[74]

Institutional policies: Specialized men in the public market

Just like the slaughterhouse, the city government assigned men to handle the inspection, administration and supervision of the activities in the marketplace led primarily by the veterinarian inspector and the market administrator. The veterinarian inspector carried out the examination not only of meat but of fish supplies as well. He was expected to make rounds in the market complex twice a day, one in the morning and one in the evening. He was authorized to order the disposal of all kinds of provisioning that are in bad condition and may cause illness to the populace. Rotten fish were ordered to be thrown in the river while unhealthy meat was burned.

Meanwhile the market administrator was the over-all manager of the marketplace and was responsible for the maintenance of the internal and external order of the space. It was incumbent for the administrator to ensure that no meat, fish, fruits, vegetables, and other provisions could enter the marketplace without the proper examination of the veterinarian inspector. To prevent fraud, the administrator safeguards the correct weights and measurements that are used in the market. Urban reformers recognized the urban environment of the marketplace as a loci of sanitary issues. The administrator secures the good hygiene and cleanliness of the market place by regularly inspecting the daily sweeping and washing of the premises, especially the patios and the galleries. Inspection of instruments used for meat cutting was also carried out by the administrator. The administrator also ensures that the proper selling techniques were observed. For example, no product could be sold in the market without the proper identification papers and identification marks, especially in the case of meat. No vendor

[73] AHN, Ultramar, 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo.
[74] Ibid.

could sell products beyond the designated areas for each product type. Meat should be hoisted and not left lying on the tables so that consumers and authorities could easily check the quality of the meat and that proper lighting should be assigned in the entire complex.

The city government relied heavily on the performance of the veterinarian inspectors as well as market administrators to safeguard the city´s provisioning. Therefore, criminal responsibility was imposed on veterinarians and administrators who were found to have practiced fraud, deception, oy any other illicit act especially allowing the entrance of noxious meat and other food supply in the complex.[75]

D. The Inspection Regime

Mechanisms of inspection were laid out in almost all phases of production and distribution in the ambit of the slaughterhouse and market complex. Slaughterhouse and marketplace reforms were not only limited to the physical and spatial improvement of these urban spaces. Part of the reforms was the regulation and control of human and non-human movement within these complex through the techniques of profiling, documenting, and inspecting as part of the so-called ¨regulatory regime¨.[76] Animal movement is profiled, documented, and monitored the moment the animals are transported to the capital, the instant they enter the abattoir, and even up to the process of animal meat distribution to public markets.

From Animal Transportation to Meat Distribution

Methods of transporting animals were subjected to inspection and control. The first level of inspection commences in the moment the animals were sold by the stockbreeder mostly from the different provinces surrounding Manila. Animals were brought to the city slaughterhouse either through land travel from nearby provinces or through sea travel from the different islands far from Manila.

Nineteenth-century regulations clearly imposed that all animals that come from the nearby provinces should be transported with proper identification and documentation, not only of the stockbreeder but also of the animal itself. The laws state that animals awaiting slaughter should be profiled and properly identified most especially their place of origin. Despite the

[75] *Reglamento para el régimen de los mercados públicos*, 44-49.
[76] Trabsky, 170.

impossibility of reconstructing a holistic picture of the origin of animals that enter the Arroceros slaughterhouse due to the very poor state and incompleteness of the ¨*Matadero*¨ collection of the National Archives of the Philippines, several extant documents may reveal to us some information about this matter. For instance, the table below shows the reported number of cattle that entered the slaughterhouse, the animals´ place of origin and the names of the stockbreeder for the specific day of 10 Oct 1854.[77] This information shows that most of the cattle came from the nearby provinces of the Tagalog region of Batangas, Laguna and Pampanga. This supply was supplemented by the stock from the northern provinces of of Nueva Ecija and La Union. A separate documentation for female cattle is done due to its value and to prevent the slaughtering of pregnant livestock since the law explicitly prohibits this practice.

Stockbreeder	**Total number of cattles that entered the Dulumbayan slaughterhouse (10 Oct 1854)**	**Origin**	**Female Cattle**
Mariano Roque	2	Pampanga	0
Mariano Roque	12	Nueva Ecija	3
Claverio Delfín	12	(La) Union	2
Claverio Delfín	6	Zambales	1
Claverio Delfín	4	Batangas	1
Petronila Guzmán	16	Batangas	3
Roberto del Baro	8	Pampanga	2
Mariano Próspero	4	Laguna	0
Julián Mola	7	Laguna	2
Juan Leogarda	5	Laguna	1

Table 3: Sample data showing the name of stockbreeders and the place of origin of cattle slaughtered
Source: Costelo, 2020. Elaborated by using the data from AF-BTNT-CCHS-CSIC, Mataderos, Microfilm, Roll 7885.

Slaughterhouse administrators are expected to provide daily and monthly reports of the state of affairs in the slaughterhouse such as documenting the point of origin of all cattle that were slaughtered in slaughterhouse. The table below[78], for example, shows that most of the cattle that was butchered for the month of April 1885 came from the Bicol region of Camarines

[77] AF-BTNT-CCHS-CSIC, Mataderos, Microfilm, Roll 7885, Veeduría del matadero público de Manila, Estado o relación de las procedencias del ganado vacuno matados en esta dependencia, Manila, 10 de octubre de 1854.
[78] AF-BTNT-CCHS-CSIC, Mataderos, Microfilm Roll 7885, Veeduría del matadero público de Manila, Estado o relación de las procedencias del ganado vacuno matados en esta dependencia para el abasto público en todo el mes de abril de 1885, Manila, 30 de abril de 1885.

followed by the Tagalog and Northern Luzon provinces. Inter-island transportation of animal was done from Masbate, Mindoro and even as far as Batanes.

Province	Number of cattle
Batangas	260
Masbate	179
Ambos	448
Ambos Camarines	108
Laguna	166
Nueva Ecija	26
Pangasinan	190
Mindoro	8
Zambales	46
Cagayan	38
Islas Batanes	57
Total	**1,526**

Table 4: Places of origin of cattle slaughtered in the Arroceros slaughterhouse for the month of April, 1885
Source: Costelo, 2020. Elaborated by using the data from AF-BTNT-CCHS-CSIC, Mataderos, Microfilm, Roll 7885.

In the late nineteenth century, there was a significant increase of animal importation especially from nearby countries in the region. These animals normally enter the Manila port and as a response, the government imposed inspection mechanisms to prevent the spread of all forms of diseases. Article 69 of the *Reglamento de Sanidad Marítima para las Islas Filipinas* published on 7 December 1890 states that when a ship carries any kind of livestock or domestic animals, these animals must be examined by a veterinarian who will be paid two pesos for each vessel that he examines. This shall be charged to the captain or the consignee. All ships must undergo rigorous inspection and should be free from any source of epizootic or suspicious disease.[79]

Merchant-houses that were consignees of boats that dock the Manila bay were required to be under inspection especially if the ships were transporting animals. This was observed for example on 7 December 1890 when merchant houses Warner and Company, Blodgett and Company, and Smith, Bell and Company as consignees of English ships ¨Diamante´, ¨Zafiro¨, and ¨Wanzing¨ wrote to the Governor General to facilitate the faster unloading of the ship´s cargoes. The ships had already anchored in the Manila port for days but could not proceed due to administrative requirements. They specifically asked the highest official in the colony to

[79] AF-BTNT-CCHS-CSIC, Beneficiencia y Sanidad, Microfilm Roll 7455, ¨La Epizootia¨.

order the *Dirección de Sanidad Maritima* to appoint a veterinarian that would inspect the animals that were on board the aforementioned ships.[80] However it took almost three weeks before the total unloading of the ships cargoes was done because it was only in 30 December 1890 that the Gobernor general was able to approve the post for the veterinarian inspector. Don Joaquin Sanchez Torrejón was appointed to the post for the inspection of domestic animals that enter the port. The veterinarian inspector was to be paid the amount of 25% from the total value of animals inspected on the ground and an additional 60 r*eales* for every case that need the inspector´s certification. The veterinarian was required to submit a report containing the state and condition of animals that entered the port.

Inside the slaughterhouse

Surveillance is paramount. Every animal entering the slaughterhouse and every carcass leaving it was inspected for disease. As Trabsky succinctly puts it,

> ¨This inspection regime is a penetrating field of visibility that extends even down to the realm of the previously unseen, in the form of death itself: under this central supervision, every death, every disease of the living world in the district and every assumable cause of disease, comes to light and is subjected, if need be, to inquiry.¨[81]

A routine was followed. The stockbreeder or the contractor should be able to present proper permits, identification papers, and deed of sale to the slaughterhouse administrator before an animal can enter the slaughterhouse. Deed of sale such as this certification from local officials serve its purpose.

> In the court of the town of Cabanatuan, province of Nueva Ecija on the 30th of March 1857: I, Don Canuto Torre current 1st lieutenant and acting as *gobernadorcillo* by absence of the aforementioned, certify that Don Mauricio Samson [resident of this town] sold three calves to Don Gregorio García former *gobernadorcillo* of this town, in the amount of 28 pesos and 6 *reales* in silver. The animals have these marks; the first animal with these marks ___ located on the right leg while the second with these ___ on the same side on the upper part of the leg. The third animal have marks like this figure ___ placed on the left leg. The transaction has been verified in the presence two trustworthy persons…[82]
>
> *En el tribunal del pueblo de Cabanatuan en Provincia de Nueva Ecija a treinta de marzo de mil ochocientos cincuenta y siete: yo. Don Canuto Torre actual teniente 1º lugar gobernadorcillo por ausencia del que lo es: Certifico y hago constar que Don*

[80] AF-BTNT-CCHS-CSIC, Veterinarios, Microfilm Roll 7455, Expediente sobre nombramiento de un profesor veterinario encargado del reconocimiento del ganado que conduzcan las naves que arriben a este puerto, Manila, 1890

[81] Trabsky (2004), p. 182.

[82] AF-BTNT-CCHS-CSIC, Mataderos, Microfilm Roll, 7866, Informe de Canuto Torre sobre la venta de reses, Cabanatuan, 30 de marzo de 1857. The markings were left blank in this transcription.

Gregorio García ex gobernadorcillo pasado de este pueblo y Don Mauricio Samson del mismo vendió tres terneras a dicho Don Gregorio García en cantidad de veinte y un peso con seis reales en plata que tienen las marcas como esta, el primero de esta forma ___ puesta en la pierna derecha y la otra ___ del mismo lado de arribas piernas y el tercero tienen las marcas como esta figura ___ puestas en las piernas izquierdas cuyas ventas se han verificado en presencia de los dos fidedignos...

According to the regulations, the papers should contain the type of animal being ingressed, the name of the stockbreeder, and its point of origin. The animals were marked in their bodies and were described based on their hair and other physical characteristics as part of the technique and process of profiling and documenting animals. These marks were stamped on the animal´s body for control. The following is a transcription of a sample identification document of the animals and their corresponding body marks that were transported to the Manila slaughterhouse. [83]

[83] AF-BTNT-CCHS-CSIC, Mataderos, Microfilm Roll 7886, Marcas, calidades de los ganados, Cabuyao, 24 de agosto de 1884.

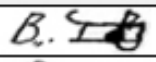
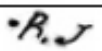
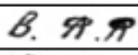
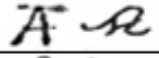
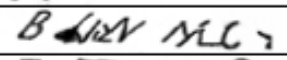
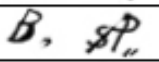
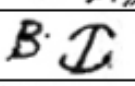
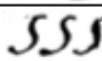
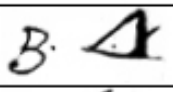
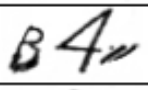
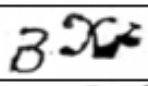
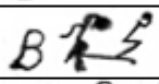
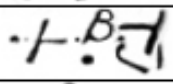
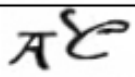
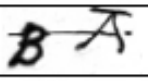
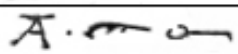
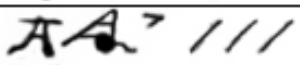
Number	Qualities	Marks
1	olive-skinned cattle	
2	cattle of reddish color	
3	olive-skinned cattle	
4	cattle of reddish color	
5	olive-skinned cattle	
6	black cattle	
7	black cattle	
8	cattle of "Dutch" hair	
9	cattle of reddish color	
10	olive-skinned cattle	
11	black cattle	
12	cattle of reddish color	
13	cattle of reddish color	
14	cattle of reddish color	
15	black cattle	
16	cattle of reddish color	
17	cattle of reddish color	
18	cattle of reddish color	
19	cattle of "Dutch" hair	

Table 5: List of cattle that entered the capital´s slaughterhouse with their corresponding qualities and marks.
Source: AF-BTNT-CCHS-CSIC, Mataderos, Microfilm Roll,7866

Animals that were declared fit for consumption were allowed enter the establishment. Animals intended for slaughter were put in the slaughterhouse every day at five in the afternoon. At eight o'clock in the evening, the slaughterhouse administrator documents the number of animals to be slaughtered that night. Strict and high standards were observed. No bovine animal that could not walk through its feet would be allowed entry. According to veterinarians, this usually manifests that the animal is suffering from an illness. Neither is allowed entry any animal that demonstrates fresh wounds caused by dogs or any other carnivorous animals. In fact, dogs are prohibited to be in the vicinity of the complex. Any animal that showed signs of illness were incinerated as shown in this report:

Honorable Corregidor of this city
In the examination done in the early hours today by Mr. Jiménez, veterinary inspector of this slaughterhouse for the public supply of clean meat, it was found out that one of the pigs suffered from swinepox disease and was ordered burned by the aforementioned officer. Suburb of Santa Cruz, 30 April 1889[84]

(Signed) Cipriano crescini

Señor Corregidor de esta ciudad
En el reconocimiento hecho en la madrugada de hoy por el Señor Jiménez, inspector veterinario de esta casa matadero de reses limpias para el abasto público, resultó que uno de los cerdos padecía del mal de lepra el cual fue quemado por orden del referido Señor. Arrabal de Santa Cruz, 30 de abril de 1889

(Firmado) Cipriano Crescini

Swinepox was the most common illness found by veterinarian inspectors among animals waiting slaughter as seen in the reports of incinerated animals on 16 July 1882, 4 April 1883, 2 April 1885. Despite the preliminary examination before animal butchering, veterinarians insisted that a second examination be done after the act. They reported the many instances that animal meat was deemed unfit for consumption only after the examination of the animal´s internal viscera. It was standard practice to separate the animal´s liver, intestines, and lungs for further inspection as these were the primary indicators of the animal´s health condition. If found unhealthy, the meat is sprayed with turpentine known for its antiseptic properties and then burned. On the other hand, healthy meat approved for public use were identified with fire marks.[85]

Distributing animal meat

Control in transporting animal meat to public markets was also included in the chain of regulations that characterized the city´s food provisioning. Only carts that passed the sanitary conditions should be used in transferring the carcass from the slaughterhouse to public markets. Carts, however, were more expensive especially because tariffs had to be paid for their utilization. Until the nineteenth century, porters or *cargadores* carried out the task of transporting animal meat from the two establishments. As a result, the government imposed

[84] AF-BTNT-CCHS-CSIC, Mataderos, Microfilm Roll, 7855, Informe de Cipriano Crescini, Veeduría del Matadero Público de Manila¨, Arrabal de Santa Cruz, 30 de abril de 1889.
[85] *Reglamento para el régimen interior de la casa matadero*, pp. 46-47.

tighter sanitation and hygiene control among the porters. First, all should have proper identification papers. Second, they should adhere to the sanitation policies such as the prohibition of performing the task without garments and the typical custom of carrying products in the shoulders.

Order and control was to be observed in the marketplace. To maintain vigilance and control, guard houses were constant structures in the markets. Divisoria and Quinta, two of the biggest markets, had a guard house which also served as the inspector´s and/or concierge´s office. This control was implemented even in the assigning of places in the markets where products to be sold. Sanitation officials of the city believed that food supplies should be categorized and that there should be designated spaces per category. The markets provided for specific areas where meat, fish, poultry, and other food supplies were sold.[86] According to city administrators, images of disorder and fraud were typical imageries of the marketplaces in Manila. To control the rising incidences of frauds in public markets, the city council of Manila established in the different markets, especially in Divisoria and Arroceros markets, stalls and stations that served as reference points for the consumers. These stalls facilitated the weighing of meat and other market products and their corresponding fixed price.[87] This measure in September 1882 came at a time when urban residents were suffering from the epidemic. Perhaps, this also served as a surveillance mechanism for the colonial government to ensure hygienic and safe food supply in time of crisis. Moreover, brawls and other causes of chaos became serious concern for the administrators as the marketplace became one of the busiest and crowded urban spaces in the city. Imposing penalties and fines was the most common response of the colonial government to prevent these types of disorder, ranging from four *reales* to two pesos. Repeat offenders were penalized of detention.[88]

Lapses in and resistance to control: clandestine butchering and expensive meat

Despite the many layers of inspection and regulation, contestations and lapses in control were documented within the slaughterhouse and marketplace complex. Residents of the city devised several ways to circumvent these mechanisms of control. An urgent matter of concern that the city council tried to address was the widespread practice of underground butchering.

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[86] AHN, Ultramar, 502, Exp. 3, Aprobación del proyecto de reconstrucción del mercado de la Divisoria de Manila, 1889-1890.
[87] ¨Secretaría del Ayuntamiento de Manila,¨ *Gaceta de Manila*, 13 de septiembre 1882, Año XXII, 254 tomo 1, 1245.
[88] *Reglamento para el régimen de los mercados públicos*, p. 45.

Clandestine butchering or underground animal meat trade was one of the many ways by which natives evaded the impositions of the government as in the case of Calcutta. Although the British colonial government erected slaughterhouses in this Indian city in the late nineteenth century, unlicensed butchering was still in full swing.[89] In Manila, this posed serious economic and health implications since many of these underground butchering (*muertas clandestinas)* were done by the contractors (*contratistas)* to evade the payment of higher meat taxes. These taxes, as the government justified, were for the maintenance and upkeep of the slaughterhouse. The city veterinarian in several letters identified this ¨illegal practice¨ as a source of the spread of disease and the dispersion of unhealthy and unsafe meat.

Confiscation and burning of the infected and contaminated meat was the direct and immediate response of the colonial authorities as seen in the following daily report on 30 April 1889.

> Fine of 5 pesos
> 11º256
> This corresponds to the fine of five pesos to Chinese Si-An number 15819 for having killed a pig outside the fixed hours in the slaughterhouse and after inspection of the veterinarian the animal meat was deemed harmful for public consumption. Manila, 15 of July 1854[90]

> Multa de 5 pesos
> 11º256
> *Corresponde a la multa de cinco pesos al Chino Si-An número 15819 por haber muerto un cerdo fuera de las horas señaladas en el matadero y después la inspección del veterinario el cerdo después de muerto fue reconocida la carne nociva para el consumo público. Manila, 15 de julio de 1854.*

Other forms of response were carried out by the colonial government by imposing tighter control. As a response, the city council, in a letter addressed to the slaughterhouse superintendent, instructed the latter to ensure that no animals declared unfit for slaughter could stay overnight, under any pretext, in any of the streets adjacent to the slaughterhouse. This, according to the veterinarian, is done to ascertain that no animal would be butchered clandestinely without his inspection and approval. During peak season, contractors bring in a greater number of animals fit for slaughter that could not be accommodated in the cages. To

[89] Samiparna Samanta, ¨Calcutta Slaughterhouse: Colonial and Post-colonial Experiences¨, *Economic and Political Weekly*, vol. 41, no. 20 (May 20-26, 2006) p. 2005 pp. 1999-2007
[90] AF-BTNT-CCHS-CSIC, Mataderos, Microfilm Roll, 7885, Multa por un muerto de un cerdo¨, Manila, 15 de julio de 1854.

avoid any fraud, a booklet is kept by the superintendent documenting the number of the cattle and the street of the corral where they will be temporarily put, with their corresponding hair and mark.

The institutionalization of slaughterhouses and attempts to standardize the slaughterhouse marketplace meant greater control by the colonial government on what can and cannot be eaten. The colonial government in Manila oftentimes reiterated the need of ¨civilizing the appetite¨ which translates to their idea of ¨clean, healthy meat¨. However clean, healthy meat also means expensive meat. To collect more funds for the municipal government of Manila for the construction, reforms, and maintenance of the slaughterhouse and marketplace complex, to finance the salary of inspectors, veterinarians, butchers, a slaughter tax was imposed by the colonial government to all types of meat that come out of the slaughterhouse. According to the government, the increasing consumption of animal meat of the Manila residents should be taken advantage for additional funds. This naturally was met with resistance not only by the natives but also by mestizos and other liberals. Pablo Ortiga de Rey, who was then sitting as Vice President in the Consejo de Filipinas, even wrote a letter criticizing this anti-poor policy in the colonial capital. He said that making available ¨healthy products (*articulos sanos*)¨ was a poor excuse for raising the prices of products that are of great necessity to the people. The liberal argued that having healthy food for the inhabitants is different from having expensive food. Demonstrating a sympathetic view to the natives´ difficulty amid higher prices of food commodities as well as his views on the natives´ idea of what it meant to be hygienic and healthy, he said

> The indigenous people do not feed on what is healthier. For them the question of hygiene is subject to the means of practicing it. If these means do not exist, it is counterproductive to make the products more expensive because it will only lead to decreased [food] consumption and consequently favor the development of epidemics resulting from hardship and hunger.[91]

The liberal also gave a more nuanced understanding of the meat consumption habits of the natives with regard the increase of prices of both meat from cattle and pig. Not all animals are equal. He stated that increasing pork prices, the animal meat which was more accessible to the natives, is like ¨causing prejudice and damage to the less affluent and poorly-accommodated classes¨. This debate led to the signing of a Royal Order in 14 June 1877 that only allowed the city government of Manila to collect 2.50 pesos for cattle, 25 centavos for pig, and 50 centavos

[91] Ultramar, 521, Exp. 6, Aprobación de proyectos de ampliación y reforma del Matadero de Manila, no. 14 Carta de Pablo Ortiga Rey, Vicepresidente Consejo de Filipinas, Madrid, 23 de abril de 1877.

for sheep as tax for killing and cleaning animal meat. Before this, 1.25 pesos was collected for each pig that is slaughtered and 2.50 pesos for each sheep.[92]

Another layer of contestation manifested in the slaughtering practices inside the slaughter halls. The practices revealed the several cases wherein the ¨modern colonial and hygienic¨ butchering technique clashed with the local butcher´s practices. For example, the inspector veterinarian reported the unhygienic custom of scattering animal blood in the slaughterhouse before killing the animals. Administrators oftentimes recorded this as a ¨disgusting habit¨ of the native butchers.[93] Scattering animal blood as a form of ritual was a precolonial custom of Filipino natives to assure a secure and inoffensive act of slaughtering. However, for sanitary officials, this posed a serious threat in maintaining the hygiene of the slaughterhouse space and was therefore prohibited. Penalties were imposed to butchers who perpetuated this practice. Despite the monetary penalty, the administrators reported that natives continuously contested this rule by incessantly practicing this ritual.

E. Spaces of Contention, Contentious Spaces

The veterinarian and the contested practice of sanitary science

Contestation was not only limited to the practice of meat examination per sé in the slaughterhouse as seen in the previous discussion. Colonial documents reveal how the inspector veterinarian as the personification of an emerging development in colonial science and new practices in sanitary science was subject to several forms of contestations as reflected in the following case. On the morning of the 28th of August 1894, an animal reported with a liver in a very bad state was butchered. The incident was made by the veterinarian inspector Mariano Felizardo to the *Subdelegación de Sanidad* because the animal meat ¨does not fulfill the right conditions for it to be distributed for public consumption¨ and that the owner of the animal did not conform to the law of declaring the meat unfit for consumption even if this was already visible at first glance on the state of the animal´s viscera. [94] The owner, who was not mentioned in the documents, did not approve of the meat inspector´s decision and the case was brought up

[92] AHN, Ultramar, 521, Exp. 6, Aprobación de proyectos de ampliación y reforma del Matadero de Manila, no. 20 Real orden de 14 de junio de 1877.
[93] *Reglamento para el régimen interior de la casa matadero*, 41.
[94] AF-BTNT-CCHS-CSIC, Mataderos, Microfilm Roll 7455, Incidente relativo al mal estado del hígado de un vacuno sacrificado en el matadero de la cabecera de Ilocos Norte denunciado por la Subdelegación de Sanidad, 1894.

to the *Junta de Sanidad*. An inquiry was done in order to ensure if the veterinarian inspector followed the protocol on meat inspection and if indeed a thorough and scientific analysis was done. The veterinarian, showing his specialization, had this as reply to the *Junta de Sanidad*:

> ¨Many parts of the liver, as seen by the common eye, had bad color… when cut, the viscera as well as the upper chambers [of the heart] released some kind of thick yellowish liquid which for me were abscesses. I acceded to the microscopic analysis using one drop of the said thick liquid.[95].

The case reflected the contestations in the practice of meat examination. The veterinarian inspector who was also a *medico titular* reportedly saw signs of noxious meat. The owner of the animal, a European, did not agree to this, and asked for the intervention of other colonial officials. The liver was brought to a pharmacist, Don José Gonzales Núñez, to be studied in a microscope. The meat inspector insisted that he was only performing his obligations for the welfare of the general public and was only ¨performing faithfully his formation in the service of ensuring safe provisioning for the people¨. He added that he has not done any to offend anybody but recognized that there were people that were very much interested of the position or were highly suspicious of their role in the new colonial administration of food provisioning. Interestingly, the pharmacist declared that the meat ¨does not contain any strange nor abnormal composition and neither has a toxic nature¨. The report convinced the governor to authorize the sale of the meat.

The nineteenth century was plagued with animal diseases. The 1880´s rinderpest epidemic became a test for the contested place of the veterinarian in the practice of public health and hygiene. A commission was formed and appointed to undertake a study about epizootia.[96] According to the report, the epidemic has struck domestic and farm animals not only in the capital and its nearby towns and provinces but in the rest of the archipelago. The *Negociado de Dirección Civil* informed the Governor General of the islands that the *gobernadorcillos* of Novaliches and San-Mateo, towns to the north of the capital, had reported the existence of a contagious illness in cattle and horses, causing damage to agriculture. The veterinarian inspector of the Manila slaughterhouse considered this a cause of alarm since the aforementioned areas are two of the meat sources of the city. The need to eradicate the epidemic

[95] The aniline dye has long been used to stain dead tissues and thus render the diner structures of the cell visible. J.W. Churchman, *Aniline Dyes in the Treatment of Infection. Industrial & Engineering Chemistry,* 18, 12 (1926), pp. 1337-1341.

[96] AF-BTNT-CCHS-CSIC, Veterinarios, Microfilm Roll, 7455, Carta del Negociado de Dirección Civil al Gobernador General¨, 28 de abril de 1888.

has never been urgent when reports from the colonial administrators in Pampanga, Bulacan and Cavite document the countless death of animals in their respective administrations. As a result, the inspector veterinarian of the capital wrote to the *Gobierno Superior Civil* to appoint a commission of veterinarians who would study the said epidemic and eventually draft a curative plan as well as preparations to prevent the spread of the disease. The commission was composed by the chief veterinary officer, the veterinarian inspector of the capital´s slaughterhouse, and a military veterinarian appointed by the Capitanía General. The inspector veterinarian suggested that, aside from the veterinarians, the director of municipal laboratory of Manila be included in the commission. Notwithstanding the urgency and gravity of the case, the inspector veterinarian proposed that the disease be studied carefully, from its causes, effects and the possible cure. The results of the study should be published by the Commission.

However, the commission was heavily criticized due to its supposed ineffectiveness and incompetence. Lack of immediate and proper coordination led to its inability to hold meetings. It was not known which of the two military veterinarians had been appointed by the Cavalry officer and it took a long time before Don Ginés Geis was appointed as the military veterinarian. The problem of remuneration was also crucial since the Commissioners wanted to know first their salary and the budget of the project before any preparatory steps be made. The doctors were paid 7,50 pesos for each day of service while the pharmacists and veterinarians were paid 6 pesos a day but this matter was resolved a little too late. Lastly, the Commission was not uncertain if the study and animal inspection and examination would only be limited in the province of Manila.[97] In effect, although efforts were clearly made by the colonial government to ensure structural and political reforms to combat the spread of epidemics, bureaucratic limitations hindered their efficient implementation.

Expropriating lands for the public works: conflict and displacement

Similar to other public works projects in nineteenth-century Manila, the colonial government expropriated private lands to give way to the construction and reconstruction of public markets. In the case of the Quinta Market, the central government in Madrid approved on 7 Sept 1860 the funds from the Ayuntamiento de Manila to expropriate some lands amounting to 4,469 pesos. The lands were purchased from Matías Menchacatorre and Company and Don Tomás Estrella. Archival records show that aside from Ambrosio Rianzares Bautista´s

[97] AF-BTNT-CCHS-CSIC, Veterinarios, Microfilm Roll, 7455, Carta del Negociado de Dirección Civil al Gobernador General, 28 de abril de 1888.

comment on the effects of the new layout in the area, the acquisition of lands for the Quinta market in Quiapo was rather faster.[98] In contrast, the appropriation of lands for the Divisoria market was a very complicated and polemical one.

The acquisition and expropriation of land for public works project has always been a complex and problematic matter. Issues of conflict and resistance and of displacement and dislocation characterized the appropriation of lands for the construction of public markets. In this case, the problems of inadequate compensation and the forced expropriation of lands and properties leading to the disturbance of the resident´s well-being were some of the specific matters that were exposed in these projects.

The construction of public markets in the city was not excused to this challenge, especially the Divisoria project. As already mentioned above, as early as 1853 the idea of constructing a market in the ¨divisoria¨ or limits of Binondo and Tondo was already brought forth. In 1856, the budget was approved by the central government and eventually construction of the public market began in August of the same year. However, it was only on 29 November 1861 that the Divisoria market was inaugurated and turned over by the contractor to the local government. Why did it take five years to finish the project? Archival sources reveal that one of the biggest challenges of this public work project was the expropriation and acquisition of land and properties to accommodate the new layout of the proposed location. On 1 December 1855, the local government already reported the need to compensate the individuals whose lands and private properties will be affected by the construction of the market. According to the plan, the width of the projected building for the market is 63 yards. Then, 30 yards should be added for the two side streets that would serve as natural avenues. In sum, the public work needs 93 yards of land. To complete this project, it is necessary to acquire and compensate lands on both sides of the Divisoria which are already occupied by houses made of stone. According to the surveyor, the total amount of indemnization would reach 21,000 pesos that would cover the stone houses in Santo Cristo street, some warehouses, a large plot with many houses made of *nipa* and some shops along the aforementioned street.[99] The acquisition of lands and properties was justified by the colonial government when stated that ¨a public market of this nature and conditions cannot be considered as a separate work in isolation but in relation to the terrain and population of the vicinity because it is necessary to provide convenient streets and avenues. The public work must not only be a structure of utility but of public adornment so

[98] AHN, Ultramar, 5187, Exp. 26, Autorizan venta de terrenos por subasta en Quiapo, 1862.
[99] AHN, Ultramar, 5187, Exp. 5206, Exp. 3, Expediente sobre construcción de un mercado en la Divisoria de Tondo y Binondo.

it must introduce the concepts of regularity and improvements to this part of the population.¨ In the month of May 1856, three proposed locations in the Santo Cristo street were discussed by the colonial officials. The three proposals differed on the number and value and private properties that were to be expropriated. The first proposal amounted to 21,000 pesos while the second and third amounted to 14,000-15,000 and 6,000-8,000 respectively. The case had to be elevated on 27 May 1856 to the *Real Casa de Malacañan.* After examining the files from the *Alcalde Mayor 1º de Manila and the Comandancia de Ingenieros arquitecto de la provincia,* Malacañan concurred on the acquisition of properties based on the first proposal due to the location´s proximity to the estuaries of Tondo and Binondo.[100]

However, problems of proper and just compensation arose when private individuals contested the government´s appraisal of their properties during the latter months of 1856. Table 6 documents the varying appraisals of affected properties. Naturally, the property owners questioned the low appraisal that was given by the government to their assets by hiring their own private surveyors. This was clearly reflected in the case of Doña Sotera Leaño who got the services of surveyor and *maestro de obra,* Mariano Majarrais. A comparison of the government´s appraisal and of Majarrais´appraisal the difference in the properties´valuation. According to the government´s report on 18 november 1856,

> ¨The property is only a one-storey structure with wooden counters. It does not have a *quísame* (ceiling) and instead has placed a frame that served as a sleeping quarter. The framework of the house is made of materials typical to this country with tile roof. It has a roof terrace where wax is ventilated and where tanks used for water storage are placed. The house has a latrine. The state of the building is bad. Nothing can be utilized from the walls, doors, and of other posessions once the property is demolished. The total value of the property is 3,180 pesos.¨

This report was heavily contested by Leaño which was affirmed by Majarrais, the surveyor that she privately hired. According to the latter´s report on 3 February 1857, ¨I declare that having examined the property, I found that all the lands that belong to it consist of 612 square yards of which 370 square yards are occupied by the house. The house has been found to be in average condition with materials of good quality. The fair value of the perimeter of the entire property and amounted to 5,775 pesos.¨[101]

On the other hand, Pedro Ignacio, Lorenzo Un Siaco, and Casimiro Lupo hired Antonio Salgado, a *maestro de obras públicas* as surveyor. According to Salgado, the value of properties

[100] Ibid.
[101] AHN, Ultramar, 5206, Exp. 5, Autorizada construcción del mercado de la Divisoria, Manila, 1857-1865.

of the three individuals is twice as high as the value stated in the government´s appraisal. Salgado valued Ignacio´s property consisting of a lot and house made of *nipa* at 73 pesos compared to the government´s assessment was only at 31.2 pesos. Meanwhile, Un Siaco´s and Lupo´s lots and houses of *nipa* were only appraised by the government at 39 pesos and 71.2 pesos respectively. This was far lesser than Salgado´s assessment at 98 pesos and 143 pesos correspndingly. These discrepancies did not only lie in the different valuations of the surveyor but of the glaring fact that the lands, albeit they belong to practically the same street and location, had different prices. This was the case when the property of the priest Don Juan Sabas was rated at 6 *reales* per square yard while Aniceto Sarangaya´s property was only prized at 1 *real* per square yard. The two hired the services of a former draftsman of the *Depósito Topográfico de la Dirección y Subinspección de Ingenieros*, Don Juan de Ocampo. To settle these disagreements, a third appraisal was done by a supposed third party to reevaluate and reexamine the properties. An examination of the third-party appraisal reveals that the new value was almost the mid-range price of the original government appraisal and the appraisal done by the private surveyors. These values more or less were very close to the final amount that was paid to the property owners as approved by the highest tribunal in the colony.

Properties	**Owner**	**Appraisal by the Director of the Public Works (in pesos)**	**Appraisal by private surveyors hired by the property owners (in pesos)**	**Third appraisal (in pesos)**	**Final Appraisal as approved by the Malacañan tribunal (in pesos)**
Lot and house made of *nipa*	Cosme Feliciano (Chinese mestizo)	440.4	829	576.2	593.3
Lot and hut	Félix Mora	124.4	264	131.3	135.38
Lot and house made of stoe	Dª Sotera Leaño	3369.4	5775	3354	3454.62
Lot and house made of *nipa*	Pedro Ignacio	31.2	73	44.10	43.32
Lot and house made of *nipa*	Lorenzo Un Siaco	39	98	50.7	52.39
Lots and house made of *nipa*	Casimiro Lupo	71.2	143	53.4	55.10
Lot, house, and other properties	Don Juan Sabas	4492	5,050	5,063	5214.89

Lot and house made of stone	Aniceto Sarangaya	1225.2	1193.5	1070	1102.10
Lot and house made of *nipa*	Juan de la Cruz	20.2	40.4	30.2	31.22
Lot and house made of *nipa*	Luisa Salasar o Aniceta Soriano	8	16	13	13.39
Lot	Francisco Gonzales	39	39		40.17
Lot, house made of stone and other possesions	Don José Victorino Santolan	3180	3180		3275.40
Lot, house made of stone and other possesions	Don José Ferrer y Tuason (Spanish)	2291.2	2291.2		2,359.99
Several lots	Don Martin Balda (European Spanish)	803	803		823.10

Table 6: Varying appraisals of private properties that were expropriated for the construction of the Divisoria market
Source: AHN, Ultramar, 5206, Exp. 5.

For the engineers and hygiene reformers in the capital, more lands were needed to construct spacious infrastructures that would meet the conditions of easy circulation, ventilation, salubrity, and public adornment. On the other hand, financial limitations posed serious restrictions to the realization of the ideal plan.

Aside from the issues of just compensation, affected residents and property owners also contested the ¨forced expropriation¨ (*expropriación forzosa*) of their possessions to give way to a public works project. A picture of uncertainty, confusion, and displacement enveloped the letters of Cosme Feliciano, Félix de Mora, Casimiro Lupo,, Pedro Ignacio, and Julián de la Cruz in their letter on 11 July 1856 when they were requesting for compensation of their lots and houses made of *nipa*. According to them, ¨…but in the midst of our deep submission we had the courage to demolish our only homes with no other land to transfer to and house our big families¨ (*Pero en medio de nuestra profunda sumisión tuvimos el valor para demoler nuestros únicos hogares con tanta más razón cuanto que no otros terrenos a donde trasladarlo y albergar nuestras largas familias*)[102] Deriving from the type of houses that these individuals own, Feliciano, de Mora, Lupo, Ignacio, and de la Cruz may represent the countless cases of

[102] Ibid.

displacement especially of low-class families in the changing urban landscapes in light of public works constructions. Their tone of submission in the letter perhaps was brought forth of the hopes of receiving the fair payment for their demolished properties. This compliant tone was non-existent in the letter of the priest, Don José Victorino, on 14 July 1856. Victorino outrightly criticized the measures done by the government and resisted to the hasty and rushed plans of demolishing the private properties. He complained that the residents were given a very short notice three days before the intended demolition. Calling on the ¨sacred and inviolable right to property and the state´s responsibility to protect this right of private individuals¨, Victorino complained about the government´s ¨violent, wearisome measure of forcing the owners to sell the residents´ lands and properties¨ and added that the government should instead look into the vacant lots that are within the vicinity.[103]

The delay in the settlement of the expropriation of lands for the Divisoria market resulted to the delay in the realization of the market´s construction. The construction began on 5 August 1856 but was suspended one month after it commenced. This suspension, which prolonged up to 28 months, was used by Don Sixto Obispo to demand compensation from the government for all the losses that he incurred while the project was interrupted. According to Obispo who was the contractor of the almost 46,000 peso-project of the Divisoria market construction, the damages amounted to 32,074 pesos. The two-year suspension he added led to the damage and loss of building materials that were already procured in 1856 such as sand, rocks and stones, lime, and wood. The demand for compensation was heavily questioned by Modesto Poladura, then *Director of the Administracion Local* in his letter on 16 March 1860. He probed the reasons why the materials were damaged and even suggested that it was the contractor´s fault that these were not properly warehoused. He also implied the possibility that the contractor did not procure materials of superior quality and conditions that is why they did not withstand that long. Tension and conflict between the contractor and the local administration was evident in the countless exchanges of correspondences. The case was forwarded to the highest tribunal in Malacañan which solicited the opinion and recommendation of the Engineers´ Corps with regard the durability and resilience of construction materials. The corps while trying to demonstrate objectivity had these to say:

> ¨It is known that the frequent and rapid change of humidity and dryness quickly destroys the good condition of wood. It is not surprising that after 28 months of being unutilized, the stockpile of wood became ¨*pasmado*¨, as they call it here in this land. The rocks and stone from Meycauayan and Guadalupe are more resistant and can withstand time but not those that have been chipped and became smaller in dimensions because of the

[103] AHN, Ultramar, 5206, Exp. 5, Autorizada construcción del mercado de la Divisoria, Manila, 1857-1865.

> inevitable splitting and opening of cracks. There is no doubt that these materials would have been preserved better had they been stored appropriately. But, where will these materials be stored? Was there an assurance on how long the interruption would last?"[104]

It can be surmised that the opinion of the Engineers´ Corps was considered by the tribunal when the former approved the Obispo´s demand for compensation.[105] Despite and inspite all the procedural and technical challenges, the market was inaugurated and turned over to the *Corregimiento de Manila* on 29 November 1861 after the structure was inspected and approved by the architect and engineers as ordered by the Governor General of the islands.

The Divisoria market project reflected the challenges and problems of colonial bureaucracy in light with infrastructure plans. It exemplified the typical colonial infrastructure project that took a while. The project after it was approved in 1856 was suspended for almost two years because there was a disagreement on the proposed location of the market. The disagreement on the location took so long that lands and properties were needed to be expropriated.

Chapter Concluding Notes

Slaughterhouse and market construction and reforms as well as policies related to food control were parts of the colonial reforms in the capital that began in the first half of the nineteenth century and was intensified in the second half of the period. These reforms were characterized by placing hygiene and health on the urban agenda. Transformations came hand in hand with other attempts of urban municipal reforms which included the construction of a potable water system, construction and reforms in cemeteries, as well as the opening, cleaning, widening, aligning, and lighting of streets. These public works projects were also related to the establishment and creation of municipal services such as garbage collection, street embellishment and adornment of the city through parks and green zones ensuring hygiene, salubrity, order and control of the neighborhood. In the mid-nineteenth century, the city government of Manila implemented a series of laws and regulations pertaining to urban policy

[104] AHN, Ultramar, 5206, Exp. 5, Autorizada construcción del mercado de la Divisoria, Manila, 1857-1865.
[105] AHN, Ultramar, 5206, Exp. 4, Incidente promovido por el contratista Don Sixto Obispo en reclamación de 32,073.96 como indemnizaciones por pérdidas sufridas en la contrata ajenas a su voluntad, Manila.

(Reglamento de la policía urbana) wherein two of the pillars were the supervision and inspection of slaughterhouses and public markets that control the food supply of the city.

This chapter demonstrates that the construction of a centralized and regulated slaughterhouse as well as public markets in nineteenth century Manila was part of the colonial government´s attempt to introduce modernity in the colonial capital. The reforms especially in the structural and spatial aspects reflected the modernizing ideas of urban space, architectural modernity, and environmental hygiene. The construction of slaughterhouses and the promulgation of slaughterhouse policies redefined the act of killing a consumable animal into an administrative and operational process. Part of the modernizing process of colonial governance was to prescribe specific premises as lawful places. The slaughterhouse then was the ¨lawful place¨ of killing animals or turning animals into meat. This could be expanded to the public market as the proper place for food distribution, assuming that food supplies in the market went through the colonial government´s inspection.

It is interesting to note that the slaughterhouses and public markets were regarded both as ¨spaces of safety and security¨ and ¨spaces of contamination and threats ¨. The threats of diseases, contamination, and disorder in the slaughterhouse and public markets emphasized these sites as focal points of colonial control. These were colonial spaces wherein policies were rationalized and controlled according to the colonial framework. The policies did not only limit the physical and architectural aspect of these sanitation infrastructures but also regulated and controlled meat production, consumption, and distribution.

Meat examination and inspection, food sanitation and control mechanisms in the slaughterhouse and markets have always been of major importance, and are intimately related with animal diseases and animal welfare. In the nineteenth century, medical practitioners, engineers, architects, and colonial reformers oftentimes reiterated in their memoirs and blueprints that the construction of slaughterhouses and the maintenance of clean markets were vital steps in the prevention of diseases from animals to humans. As Amy Fitzgerald argues, conceptually, an examination of the slaughterhouse, and by association the market, as an institution has a lot to offer: *it is a location from which one can view economic and geographic changes in the production of food, cultural attitudes towards killing, social changes in small communities, and the changing sensibilities and relations between humans and non-human animals.* [106]

[106] Amy Fitzgerald, ¨A Social History of the Slaughterhouse: From Conception to Contemporary Implications,¨ *Human Ecology Review* vol. 17, no. 1 (2010), 58.

However, the construction of a slaughterhouse or an abattoir nor the reforms in public markets did not directly spell progress resulting to the absence of sanitation and hygiene problems related to food supply. Even the pioneer cities of this innovative public work project, such as London, reported the continuous challenges of non-existent standardized system of inspection and the terrible conditions of salubrity of the space.[107] Moreover, the process and techniques of inspection and regulation undoubtedly was not subject to outright cooperation especially because colonial intervention meant higher prices in food commodities in the form of taxes.

Continuities and ruptures characterized these sanitary infrastructures during the early American rule. The Philippine´s new rulers continued the use of the existing slaughterhouse and public markets structures in the capital while maintaining the need for reforms in the structures. The 1905 Annual report still listed the Divisoria and Quinta markets as the top two markets in terms of collection but opened smaller ones like the Gagalangin and Pandacan markets which were opened in 1904 and 1905 respectively. By this time, it was reported that the number of vendors of food supplies and other products greatly increased that ¨gave the markets an unpleasant appearance¨. On the other hand, the need to elevate the slaughterhouse and its improvement in terms of capacity were recurring concerns of the new colonial government. [108] Meat inspection in slaughterhouse still was the principal issue as seen in the 1916 report wherein out of 109, 025 animals that were inspected in the Manila slaughterhouse, 1,760 were condemned and the remaining 107, 265 passed for public consumption.[109]

[107] Ayling, 1.
[108] *Annual Report of the Municipal Board,* 1905. Manila: Municipal Board, p. 44.
[109] Stanton Youngberg, ¨Resume of the work of the Veterinary Division for the Year 1916,¨ *The Philippine Agricultural Review,* vol. 10, no. 1 (1916), p. 176.

Chapter 7.

Los cementerios generales: Cemetery Constructions and Reforms in Colonial Manila

[a] causa del baguio en la noche de 13 del mes corriente
se han caído las casas y cercos de los campos santos
de los pueblos de Tondo y Malate, que se hicieron con motivo de la epidemia.
El público padezca el sufrimiento y el oprobio de que
los cuerpos sepultados allí vengan a ser pasto
de las aves y los perros[1]

[d]ue to the typhoon on the 13th night of the current month,
the houses and fences of the campos santos
of the towns of Tondo and Malate, that were erected owing to the epidemic,
had collapsed. The public endures the suffering and shame that the
bodies buried there become grazing
for the birds and the dogs.

The struggle of keeping the dead from polluting the city was a global movement in the late eighteenth to the nineteenth century. The image of a stinky and fetid cemetery was part of the modernizing societies´ bigger preoccupation concerning hygiene and public health. This fell side by side with the images of unkempt and chaotic streets, overcrowded dwellings, insalubrious markets and slaughterhouses, stagnant waters and rivers, and the like. In colonial Manila, the construction of general cemeteries was part of a bigger scheme of sanitary infrastructures that characterized the second half of Spanish colonial rule in the Philippines. This chapter traces the development of cemetery construction and reform in Manila from the emergence colony of the sanitary reform ideas related to graveyards and burial practices, the early attempts of cemetery construction outside of the populous areas of the city in the late eighteenth century up to the creation and management of nineteenth-century general cemeteries of Paco and La Loma. Through the cemeteries, an examination of the period´s changing ideas with regard mortality and public health and sanitation and how these notions were physically translated in the planning and creation of general cemeteries could be brought to light.

The development of urban death infrastructures, particularly the cemetery, in colonial Manila could be best understood in the context of the city´s sanitation problems and challenges and the outbreak of epidemics and contagious diseases. Manila, the Philippines´ colonial

[1] AGI, Ultramar, 521, Gobernador de Manila da cuenta sobre la erección de cementerios fuera de poblado en Filipinas, 1789, Carta del Fiscal Joaquín Josef Alonso de Tejada, 13 diciembre 1791.

capital, with its rapid urbanization, unprecedented demographic increase, and expanded links to international commercial routes, was the location most seriously hit by these waves of epidemics. In the late eighteenth century, viral epidemics wreaked havoc to the port city while it was cholera that put thousands of people to the ground in the nineteenth century. Manila´s topography characterized as a low-lying and chronically damp and fetid region surrounded by rivers and canals became an easy breeding ground for this water-borne disease. The gravity of the cholera epidemics was so serious that these provoked a cemetery crisis in nineteenth-century Manila. Massive deaths leading to overcrowded burial grounds and putrefying graveyards threatened the public health of the capital. Dubbed as the ¨classic epidemic disease of the nineteenth century¨[2], the Asiatic cholera predominantly characterized the history of epidemiology in nineteenth-century colonial Philippines. Accounts document at least seven colony-wide cholera epidemics in the years 1821-1823, 1830, 1842, 1854, 1862-1865 1882-1883, and 1888-1889. Asiatic cholera, viewed as the most terrifying disease that ravaged the colony, was considered the cause of death of almost 10% of the total population.[3]

Apart from the lens of diseases, the study of the transformation of cemeteries and the ¨significant changes in the attitudes and behaviours toward the dead¨ could also be examined and analysed in the ¨bigger processes of modernization, secularization, urbanization, and the rise of the middle-class family¨.[4] In the next pages, we will see that the project of building cemeteries in colonial Manila could be best understood using these different and overlapping perspectives. In Manila, the burial problem highlighted the different responses of the different authorities of the colonial society such as the central colonial government, the city council, the techno-scientific experts, medical and sanitary professionals and how they viewed and addressed the cemetery crisis brought by the disease explosion.

Like other colonial public works projects, the cemetery was transformed into a space governed by a web of norms, policies and regulations. As a consequence, the cemetery, perhaps the most familiar monument for the dead, became a ground of contention for the living wherein colonial ideas and policies of sanitation, order, and control were challenged, resisted, or negotiated. The repetitive laws on cemetery management and burial regulations that were promulgated within the realm of the empire reflected two sides of the coin: first, the undeniable

[2] Richard J. Evans, ¨Epidemics and Revolutions: Cholera in Nineteenth-Century Europe,¨ *Past and Present,* no. 120 (Aug 1988), pp. 123-146.
[3] See: Xavier Huetz de Lemps, ¨Les Philippines face au fantôme du Gange: le choléra dans la seconde moitié du XIXe siècle,¨ *Annales de Démographie Historique*, (1990), pp. 309-335.; Ken de Bevoise, *Agents of Apocalypse. Epidemic Diseases in the Colonial Philippines* 8New Jersey: Princeton University Press, 1995), pp. 164-184.
[4] Erin-Marie Legacey, *Making Space for the Dead* (Ithaca, NY: Cornell University Press, 2019), p. 5.

growing preoccupation of the authorities on the risks posed by the cemeteries and other spaces dubbed as foci of infection to public health; and second, the constant struggle of implementing these regulations on the ground.

Leading in the sanitary debates were the European societies confronted by problems of urbanizing and industrializing cities. During this time, different hygienist schools of thoughts emerged which guided the sanitation policies of burial and cadaver disposal and structural design of graveyards. A little late from the other European societies, the Spanish crown´s sanitary preoccupation of creating hygienic cemeteries outside of towns and sanitary burial practices to prevent the infection of was documented in the late eighteenth to the nineteenth century as documented in the different cases of Madrid, Galicia, Barcelona, etc.[5] In American cities, such as New York, cemetery and burial improvements were propelled by the mounting number of corpses from diseases which posed environmental hazards for the urban residents.[6]

Eventually, these sanitary ideas rippled through the different colonial societies. In colonial India, the heightened preoccupation for increased deaths in the late eighteen to the nineteenth century due to public health concerns led to the emergence of ¨ordered, planned, spacious cemetery design¨ in Calcutta and Surat. Studies also showed that this was the case in colonial Malaya and colonial Sumatra.[7] In late nineteenth century to the early nineteenth century, cemetery improvement was one of the sanitation concerns that influenced greatly the urban configuration of colonial Singapore under the British rule.[8] Most of the time, changes in the city morphology and built environment were products of the society´s responses towards epidemics and diseases such as the case of colonial Hong Kong.[9] With the spread of the Enlightened reformism movement from the metropolis to the colonies, the cemetery reform arrived in the Carribean colony of Cuba with the construction of a cemetery outside the city in

[5] Carlos Saguar Quer, ¨Carlos III y el restablecimiento de los cementerios fuera del poblado,¨ *Fragmentos,* no. 12-14 (1988) 241-259; Carlos Saguar Quer, ¨Paraísos Cercanos: Los cementerios históricos de Madrid,¨ *Cultura y Naturaleza en Madrid: Estrategias para una mañana* (Madrid: Instituto de Estudios Madrileños, 2019) pp. 173-196. Francisco J. Durán Villa, Carlos M. Fernández Fernández, and Jesús Sánchez García, ¨Asilos de la muerte. Higiene, sanidad y arquitectura en los cementerios gallegos del siglo XIX,¨ *SEMATA Ciencias Sociais e Humanidades,* vol. 17 (2005), pp. 435-472.

[6] María Farland, ¨Decomposing City: Walt Whitman´s New York and the Science of Life and Death,¨ *ELH,* vol. 74, no. 4 (Winter 2007), pp. 806-807.

[7] Harold Mytum, ¨Public Health and Private Sentiment: The Development of Cemetery Architecture and Funerary Monuments from the Eighteenth Century Onwards,¨ *World Archaeology,* vol. 21, no. 2 (October 1989), pp. 286-287.

[8] Yeoh (2003), p. 1996.

[9] Christopher Cowell, ¨The Hong Kong Fever of 1843: Collective Trauma and the Reconfiguring of Colonial Space,¨ *Modern Asian Studies,* 47, 2 (2013), pp. 329-364.

1804. The reform movement, however, was confronted with tensions and conflicts between the secular and religious authorities in colonial Havana.[10]

In the Philippines, three important works could be cited that served as basis for this chapter. This chapter seeks to complement and expand these works on cemeteries in Manila, Xavier Huetz de Lemps´ ¨*La controversia de sepultura en Filipinas*¨ and Lorelei de Viana´s article ¨Public Sanitation and Cemeteries in 19th Century Manila¨. Huetz de Lemps examines the power play concerning burial practices in the colony by providing a nuanced discussion and analysis of the conflict between the religious and the secular in the shaping and implementation of rules and regulation with regard the burying of the dead.[11] On the other hand, De Viana demonstrates the role of the cemeteries in the public health and hygiene in times of epidemics, the Manila municipal government´s efforts to promote public sanitation, and a glimpse of the conflicts that involved the Church and the State in relation to cemetery management.[12] Meanwhile, the Chinese ethnic question and the colonial authorities´ efforts of control to separate the burial grounds of converts and non-converts were examined by Chu and Ang See.[13]

A. *Fuera de Poblado:* Ideas and Laws Concerning Burial and Constructing Cemeteries

In the spirit of public health (¨*salud pública*¨), Carlos III promulgated a Royal Cedula on 3 April 1787 ordering that ¨cemeteries should be erected outside of towns…in ventilated places near the parishes and distant from the residents´ houses¨ utilizing as chapels the ¨hermitages (*ermitas*) that exist outside of the villages¨.[14] According to the same royal cedula, the rule was passed after the dreaded effects of the epidemic experienced in the Villa de Pasajes, in the province of Guipúzcoa in 1781 and the similar catastrophe that wreaked havoc to other provinces of the kingdom. These epidemics resulted to multiple deaths that posed a serious

[10] Adrian Camacho Domínguez, ¨Los Conflictos entre la Iglesia y el Estado: El control de los cementerios habaneros (1806-1903)¨ in Xavier Huetz de Lemps, Gonzalo Álvarez Chillida, María Dolores Elizalde (ed.) *Gobernar Colonias, Administrar Almas. Poder Colonial y Órdenes Religiosas en los Imperios Ibéricos* (1808-1930), Madrid: Casa de Velázquez, 2018.

[11] Xavier Huetz de Lemps, ¨La Controversia de las Sepulturas en Filipinas¨ in Xavier Huetz de Lemps, Gonzalo Álvarez Chillida, María Dolores Elizalde (eds.) *Gobernar Colonias, Administrar Almas. Poder Colonial y Órdenes Religiosas en los Imperios Ibéricos 1808-1930* (Madrid: Casa de Velázquez, 2018). Many ideas of this paper were also inspired from Huetz De Lemps unpublished paper entitled: ¨A Matter of Grave Concern: Burial Sites and Funeral Rites in Nineteenth-Century Philippines,¨ Plenary paper read in the Philippine Studies Conference, 23-24 July 2020.

[12] Lorelei D.C. De Viana, ¨Public Sanitation and Cemeteries in 19th Century Manila,¨ *UNITAS,* vol. 77, no. 1 (March 2004), pp. 88.

[13] Richard Chu and Teresita Ang See, ¨Toward a History of Chinese Burial Grounds in Manila during the Spanish Colonial Period,¨ *Archipel,* no. 92 (2016), pp. 63- 90.

[14] *Real Cédula de Su Majestad y Señores del Consejo, en que por punto general se manda restablecer el uso de cementerios ventilados para sepultar los cadáveres de los fieles...* 3 de abril de 1787.

threat to the general well-being of the people. With the combined recommendations and views of the Royal Council and the Religious Orders in the kingdom, the King considered a ¨general ruling that would guarantee the public health of the people¨.[15]

In the late eighteenth century Spain and Europe, environmental ideas dominated the debate with regard burial practices and regulations. These debates which were characterized by political, scientific and religious ideas, culminated in the Royal Cedula on 3 April 1787. During this period, the miasmatic theory of disease prevailed in the debates following the idea that diseases were transmitted through noxious air and putrid elements. Although the relation between environmental and physical elements and the nature and origin of diseases was already recognized even in the earlier times as shown in Hippocrates´classic work on *Airs, Waters, and Places,*[16] the eighteenth century witnessed an increased production of knowledge and works among hygienists, urban reformers, and medical practitioners emphasizing corrupted air and decomposition as the deadly cause of diseases. That is why, eighteenth century sanitary reforms accentuated the need to eradicate the atmospheric impurities and to control some specified ¨spaces of insalubrity¨ such as cemeteries, sewers, hospitals, prisons, etc.[17] Scholars argue that in Spain, cemetery reforms was one of the first sanitary policies related to the Bourbon reforms of the Spanish empire. The Catalan mathematician Benito Bails, educated in France and was a product of the ¨*cultura de las luces*¨, as well as the doctor and priest Francisco Bruno Fernández were at the helm of the sanitary debates concerning the insalubrity of the existing burial practices in Spain.[18] By the nineteenth century, the medical environmentalist idea that ¨the magnitude, spread, and speed of the pestilence could be explained by the wind-blown miasmas¨ continued to persist.[19] The fear for these disease-causing airs propelled the construction of sanitary infrastructures and the implementation of spatial norms and regulations to control these unhealthy spaces.

Before the prohibition of inhumation in churches and temples, burying the dead inside the church was a widespread practice in the belief that ¨the departed always remain under God's protection and are always present in the memory and prayers of their relatives¨.[20] However, the

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[15] *Real Cédula de Su Majestad y Señores del Consejo, en que por punto general se manda restablecer el uso de cementerios ventilados para sepultar los cadáveres de los fieles*….3 de abril de 1787.
[16] Hippocrates, *Airs, Waters, and Places* (The received Greek text of Littré, with Latin, French, and English translations by eminent scholars), (London: Messrs. Wyman & Sons, 1881), pp. 1-8.
[17] Mercedes Granjel and Antonio Carreras Panchón, ¨Extremadura y el debate sobre la creación de cementerios: Un problema de salud pública en la Ilustración,¨ *Norba, Revista de Historia,* vol. 17 (2004), pp. 75-76.
[18] Enrique Giménez Lopez, ¨La exhalación de la muerte. La aportación del matemático Benito Bails a la polémica sobre los cementerios en el siglo XVIII,¨ *Revista de Historia Moderna,* no. 17 (1998-1999), pp. 113-114.
[19] Vladimir Jankovic, ¨Gruff Boreas, Deadly Calms: A Medical Perspective on Winds and the Victorians,¨ *The Journal of the Royal Anthropological Institute,* vol. 13 (2007), p. S152.
[20] Granjel and Carreras Panchón, (2004), p. 76.

church became a serious health concern as time passed. The demographic increase which consequently led to an increased interment in the temples through time, the churches´ structural limitations in terms of space and the type of materials used (most especially in the walls where the dead are kept), and most importantly the spread of epidemics were some of the contributors to this salubrity problem. Images of humidity, scarce ventilation and overcrowding not only of the interred dead as well as of parishioners were typical representations of churches. To make things worse, the burial of the dead in the sacred temple produced ¨fluids that seeped through the earth, the stones or wood from the ground and the stench that the cadavers emit in the process of decay wrapped the whole church¨.[21]

Prohibiting interments in churches was the most difficult to implement as towns and cities both in the Spanish metropolis and the overseas territories held on to the religious and traditional beliefs concerning death and burial. The difficulty of establishing consistent compliance to the law led to the declaration of thousands of legal mechanisms for the general public to observe. Throughout the late eighteenth to the nineteenth century, numerous, instructions, edicts, and regulations were promulgated concerning the cemetery and burial rites reforms. In 1890, Antonio Elías de Molins compiled all the orders proclaimed in the peninsula and in the Spanish overseas territories in his work *Legislación canónica, civil y administrativa vigente en España y sus posesiones de Ultramar sobre Cementerios* tracing the earliest decrees on the construction of cemeteries, ecclesiastical burials and funerals, rules on exhumation and transfer of cadavers, cemetery regulations of different cities and cemeteries, up to the modern conduct of autopsies, forensics, and death registries.[22] From 1700 to 1862, a total of 1,944 proclamations were recorded concerning these matters with the majority of them being declared from 1840 to 1860. Scholars argued that the declaration of almost 1, 309 laws beginning in the fourth decade of the nineteenth century reflected that it was during this time that the definitive crystallization of hygienic and sanitary ideas experienced solid grounding in the Spanish administration.[23]

In the Philippines, the repeated proclamation of decrees, orders, and circulars on cemetery and burial reforms reflected the prolonged resistance to the policy and the continued practice of church inhumation. Some of these were the circular published on 19 January 1848,

[21] Ibid.
[22] Antonio Elías de Molins, *Legislación canónica, civil y administrativa vigente en España y sus posesiones de Ultramar sobre Cementerios* (Madrid: Victoriano Suarez, 1890).
[23] Francisco J. Durán Villa, Carlos M. Fernández Fernández, and Jesús Sánchez García, ¨Asilos de la muerte. Higiene, sanidad y arquitectura en los cementerios gallegos del siglo XIX¨ *SEMATA Ciencias Sociais e Humanidades* vol. 17 (2005) p. 237.

a royal order on 22 April 1853 and a royal decree on 26 November 1857. The first called on the compliance of all towns in the colony to establish their cemetery far from the settlements. The second emphasized the prohibition of funeral practices inside churches after reports were made by the governor of Pangasinan that priests and coadjutors of the towns of Lingayen and Dagupan were still buried inside the towns´churches. As a form of the civil authorities´ negotiation to the Religious, the former ordered the designation of a special place in the civil cemeteries for the latter. [24] The third decree which was proclaimed during the term of Norzagaray provided specific regulations on how the cemeteries should be erected for the interests of *religion, humanity, and public health*: first, the governors and *gobernadorcillos* with the help of the parish priest should immediately identify and choose a suitable land far enough from the settlements while also taking into consideration its highest possible elevation, good ventilation, and situated at the opposite direction of the prevailing winds especially during the dry season to prevent the pernicious miasmas to reach the population; second, the cemeteries should be encircled with a fence made of stone, brick or any strong wood; third, the classification and selection of lands within the graveyard to be especially dedicated to parish priests, Spaniards and their descendants and all deceased after paying the right burial fees as approved by the authorities; fourth, the planting of trees and flowering plants to absorb the miasmas and the erection of a Holy Cross in its entrance to indicate the sanctity of the place; fifth, the appointment of a guard for all cemetery to be paid by the local resources.[25]

On 28 July 1866, another circular was promulgated by the Superior colonial government in the Philippines assuring that a parcel of land be dedicated for the inhumation of stillborn babies. The authorities expressed concern on the widespread practice of the natives of burying their offspring who were born dead or without baptism on the plots nearby their houses, or even sometimes in the little corners inside the houses. The colonial government and the sanitary reformers commented that this was a highly pernicious custom not only because of the corpse´s desecration but also to the dangers that it could pose to the inhabitant´s hygiene and sanitation. The presence of decaying bodies within the immediate surroundings of the dwellers posed serious concerns as it may lead to the spread of different kinds of diseases. As a result, the high

[24] Antonio Elías de Molins, *Legislación canónica, civil y administrativa vigente en España y sus posesiones de Ultramar sobre Cementerios,* Madrid: Victoriano Suarez, 1890, p. 267.
[25] *Decreto de 26 de noviembre de 1857 del Superior Gobierno dictando reglas para la elección y edificación de cementerios fuera de poblado.*

authorities called on local officials to provide separate spaces for this kind of interment in the different cemeteries.[26]

On 18 October 1887, the *Dirección General de Administración Civil de Filipinas* enumerated the previous circulars, royal orders and royal cedulas related to the matter: 16 April 1804, 30 June 1814, 23 February 1821, 2 June 1833, 30 November 1833, 13 February 1834, 12 May 1849, 28 August 1855, 6 August 1867, 15 February 1872, 28 May 1884, and 18 October 1887.[27] Apart from the royal decrees and orders that were promulgated for the empire´s compliance, specific circulars and instructions were also declared by the different cities and ayuntamientos in the peninsula especially in Madrid and Barcelona. These regulations were cascaded to the overseas territories of Cuba, Puerto Rico, and the Philippines and additional decrees that attempt to address the peculiarities of the colonies.

B. Cemetery Crisis: Attempts of Cemetery Reforms and the Problems of C. Public Health and Sanitation in Manila

The 1791-1793 Cemetery Plan: A plan in the midst of an impasse

Archival documents show that the idea of constructing a general cemetery outside the populated areas (*fuera de poblado*) was already introduced in the late eighteenth-century Manila, several years after the declaration of the 1787 cemetery decree. However, this idea generated tensions and conflicts as the Religious, known to have extensive control in colonial Philippines, openly resisted this policy. The Religious consistently cited that the departed should always remain under sacred grounds and God's protection. On the other hand, colonial sanitary reformers portrayed the small parish graveyards in the suburbs of Manila as horrific health risks. Images of humidity, scarce ventilation and overcrowding in church burials threatened the health of the public. This constant push and pull of ideas marked the burial debates in colonial Manila.

The troubling sanitary and hygienic conditions of the colonies in relation to church burial was more emphasized by the metropolis through another Royal decree on 27 March 1789 which was addressed specifically to the viceroys and the governor generals in the colonies. The royal decree specifically attributed the emergence of diseases ¨to the number of churches

[26] *Circular de 28 de julio de 1866 del Gobernador superior civil de Manila disponiendo se destine al costado de los Cementerios un pequeño recinto para enterrar los niños que fallecen sin bautismo.*
[27] AHN, Ultramar, 5267, Exp. 4, Circular a los Jefes de Provincias y Distritos, 18 de octubre de 1887.

distributed throughout the city wherein burials produced corrupt and impure airs due to the warm and humid conditions inside these temples¨. Furthermore, the decree cited that ¨more deceased individuals were allowed interment that was beyond the churches´ extension and capacity, and in certain seasons of the year they were so many inhumations that one could barely walk on without touching soft and reeking graves¨.[28] These images that posed dangers to public health were utilized for pushing the urgency of burying all the departed ¨with nobody as exception¨ to cemeteries outside of the city or town. With the help of the archbishops and bishops, the authorities in the colonies were ordered to report on the viability of the establishment of cemeteries outside of the city or town center as well as a detailed information on the number of cemeteries needed in relation to the population of the colonies and the costs that these would entail.[29]

As a response, the colonial administrators in the Philippines, which included the civil and religious officials, furnished reports on the state of burial in the islands. The reports took a span of almost five years which included letters from civil and religious administrators in the islands from 1789 to 1793. These documents served as litmus on the perception of the colonial administrators, both on the civil and religious side, with regard the cemetery and burial reforms that were introduced by the metropolis. Félix Berenguer de Marquina, then governor general of the islands, and Joaquín José Alonso de Tejada, civil Fiscal of the Royal Audiencia, represented the voice of the high civil administrators in the colony. The governor general expressed concerns that it was very difficult to implement the cemetery reform in the colony. Two principal reasons could be cited. First, the Treasury lacked the sufficient funds to construct new cemeteries, and second, opposition from the religious officials in the colony represented by the Archbishop of Manila and the three suffragan bishops of Nueva Segovia, Cebu, and Nueva Caceres was significantly strong. In the case of the colony´s capital, the Ayuntamiento de Manila was also lethargic in its response due to financial constraints.

Early before the expansive and serious epidemic outbreaks and cemetery crisis of the nineteenth century, colonial high officials in the Philippines already recognized the need to construct cemeteries outside the dense settlements of Manila and prohibit the keeping of mortal remains in enclosed churches. Resonating the miasmatic view on the origin of the disease that was dominant at the time, Tejada in a report on 22 June 1793 cited that the toxic and virulent airs emitted by the cadavers coupled with the island´s climatic conditions and topography were easy agents of all sorts of illnesses and threats to public health. According to the colonial

[28] *Real cédula de 27 de marzo de 1789*.
[29] Ibid.

official, the different diseases that emerged in Intramuros and the arrabales in the past years were effects of the noxious gases emitted by the church burials and graveyards. He even argued that no other territory in the kingdom was a cemetery most necessary than in the islands:

> In that archipelago, where lands are cut from a multitude of estuaries, lagoons, swamps, rivers, and seas which fill the atmosphere with humidity, lands are bathed by agents of corruption that a heat typical of the torrid zone could be barely moderated by some strong winds in between the year. [Considering] this union of principles and the speed with which the fermentation of all dead bodies occurs here, corpses should not be kept in the temples for long. The malignant exhalations that they naturally emit contribute to the formation of dangerous complications for the living, who, for the same reasons, are less vigorous and less able to resist the effects of an air incorporated with a similar type of particles. For some doctors, a partial effect of these are leprosy, scabies, and bad elephantiasis with a different variety of scabs and skin rashes that are common among the inhabitants of the country. There seems to be no doubt that these would diminish greatly if this certain cause of infection would be cut off. [30]
>
> *En aquel archipiélago con sus terrenos cortados de multitud de esteros, lagunas, pantanos, ríos y mares, que recargan la atmosfera de humedad, a estos terrenos los bañan agentes de corrupción, un calor propio de la zona tórrida que algunos vientos procelosos de entre año apenas alcanzan a moderar. Esta unión de principios […] y por la rapidez con que sucede aquí la fermentación de todo cuerpo muerto, los cadáveres no se deben mantener oreados por más tiempo en los templos, las exhalaciones malignas que naturalmente arrojan contribuyen a formar con ellas las complicaciones peligrosas para los vivos, que son por las mismas causas menos vigorosos y capaces de resistir las impresiones de un aire incorporado de semejante clase de partículas, hecho allí ralo por el mismo concurso de personas. Efecto de esto en parte son para algunos facultativos la lepra, sarna y mal lazarino con otra variedad de costras y erupciones cutáneas que se hallan cundidas estas por los habitadores del país, las cuales no parece poderse dudar que menguarían mucho si se cortase de raíz aquella causa cierta de infección.*

However, the same urgency and conviction of improving public hygiene and sanitation was absent among the religious officials at the time. The Archbishop of Manila and the three suffragan bishops of Nueva Segovia, Nueva Caceres, and Cebu responded to the cemetery reforms with much apprehension and ambiguity. In a letter on 4 June 1791, Juan Antonio Gallego, the Manila Archbishop at the time, asserted that the plan would be difficult to implement in the colony as the natives themselves preferred burying their dead in churches. He cited that when a smallpox epidemic hit the capital in 1788, an edict was promulgated ordering the burying of those who were afflicted by the disease in provisional cemeteries far from the populous areas of the city. These temporary graveyards were located in Malate, Bancusay (Tondo), and Mayjaligue (Santa Cruz). However, the archbishop reiterated that this measure

[30] AGI, Ultramar, 521, Doc. 2 Carta del fiscal civil con testimonio del expediente instruido en este Gobierno sobre la Real Cedula relativa al establecimiento de cementerios fuera de poblado, 22 de junio de 1793.

failed as the capital´s residents themselves denied the interment of their loved ones in the provisional cemetery and continued interring their deceased in the sacred grounds of the church. Nevertheless, the Chinese ¨who were not troubled with the burial place because of their belief that their souls transmigrate to their homelands in China¨ were the only ones who were made to comply the edict. Convinced that church burials should be allowed to persist in the colony, the archbishop ended his letter with these words:

> [f]or more than two centuries, no malevolence has been experienced from the burial of cadavers in churches where fetidity is not perceived, [this is] because all burials are all in the floor which are partly paved and partly parqueted with good wood; [and also] because humidity has a lot of activity to decay the corpses and for this reason it is seen that in these countries individuals of both sexes live healthy and there are those who live more than a century[31]
>
> *en más de dos siglos no se ha experimentado allí mal alguno proveniente de las sepulturas en las iglesias donde no se percibe fetidez, ya por hallarse todas en sus pavimentos parte enlosadas y parte entarimadas de buena madera y ya porque la humedad tiene allí mucha actividad para consumir los cadáveres y por esta razón se ve que en aquellos países viven sanos los individuos de uno y otro sexo y los hay mayores que el siglo*

Meanwhile, the bishops of Nueva Segovia and Cebu in their letters on 9 October 1790 and 15 January 1791 respectively argued that the towns in their dioceses lacked the funds for the construction of new cemeteries because the natives barely paid for the burial of their deceased. Instead, they suggested that bare lands could be used as makeshift cemeteries should the need arise in times of epidemics. The bishop of Nueva Caceres informed the civil government on 5 January 1791 that perhaps the diocese could erect a cemetery from light materials such as bamboo and palm wood but additional budget should be allocated for the payment of the builders and carpenters. In a separate letter on 9 April 1791, the Manila archbishop lamented that raising more funds for the new cemetery could be a toll since the rehabilitations from the 1781 earthquake and the 1780 strong typhoon were not yet fully realized in the capital. For instance, in the extramuros, the parish of Binondo had still an unpaid debt of 4,000 pesos for its reconstructions from these calamities.[32]

Convinced that the death infrastructure was indispensable for the capital´s public well-being, Tejada persuaded the central government and the religious groups that the benefits that could be derived from eliminating one of the sources of diseases would compensate the construction costs of cemeteries away from the populous areas of the city and towns. According

[31] AGI, Ultramar, 521, Carta del arzobispo Juan Antonio Gallego, 4 de junio de 1791.
[32] AGI, Ultramar, 521. Carta de Fray Juan Antonio Gallego, 9 de abril 1791.

to him, the expenditures for the cemetery erection should not serve as an obstacle for these will be very light and bearable. He proposed that native labor could be employed especially during the off-planting season. An additional tax could be imposed on the galleon products coming from the Chinese coast and the Bengal bay, particulary cotton fabric and *cambaya* cloth. This additional collection was foreseen to cover the construction costs of a new cemetery in the capital as well as increase the Royal Treasury funds. In the case of Manila, 3,412 pesos and 4 reales were needed to cover the construction of Manila´s necropolis with an ossuary and a chapel. Tejada noted that, in the towns and provinces, a cemetery with a basic fence made of stone or brick and a small chapel with a cross would be sufficient enough as long as it is located far from the settlements of the people.[33]

Despite the opposition from the religious groups, Josef Alonso de Tejada called on the city council of Manila (*Sala Capitular del Ayuntamiento de Manila*) to take the necessary initial steps for the realization of a cemetery outside the city center, starting with the identification of the number of cadavers that were regularly interred in the different church graveyards in the city as well as the burial grounds used by the Hospital de San Juan de Dios. Tejada further suggested that the number of deaths for the past five or ten years in the city should be recorded and an estimate of possible casualties in times of epidemic should be made so that the capital could prevent the health risks posed by massive burials near the settlements. Despite the central government´s repetitive calls, Tejada reported that the municipal authorities did not show urgent action and ¨demonstrate unwillingness to a matter that is for the benefit of public health¨ (*demuestra tan remisa a un asunto que se encamina todo a beneficio de la salud pública*). [34]

Responding to Tejada´s criticism of its inaction, the municipal council composed of Vicente Díaz de Conde, Vicente Laureano de Memije, José Caral Bermúdez, Francisco Fernández de Sendera, Andrés de Aras Valdez, José Fernández, Antonio Madrigal, Lorenzo de Burgos submitted on 29 February 1792 a plan for the construction of a cemetery away from the heavily populated areas of the city. The cemetery plan (Figure 1) which amounted to 3,412 pesos and 4 reales, authored by Corporal Master of Royal Works Mariano Falcón, was 100 *brazas*[35] in width and consisted of a stone fence of 3 ½ *varas*[36] high, an ossary, and a small chapel as seen in Figure 1. In order to raise funds for the proposed cemetery, the Ayuntamiento

[33] AGI, Ultramar, 521, Carta del Fiscal Tejada, 28 de noviembre de 1792.
[34] Ibid.
[35] One *braza* is equivalent to 1.83 meters.
[36] One *vara* is equialvelent to less than a meter.

suggested the collection of one *real* tax for every *tinaja* (large jar) of coconut wine. These funds would be added to the local resources of the city for the public graveyard construction.

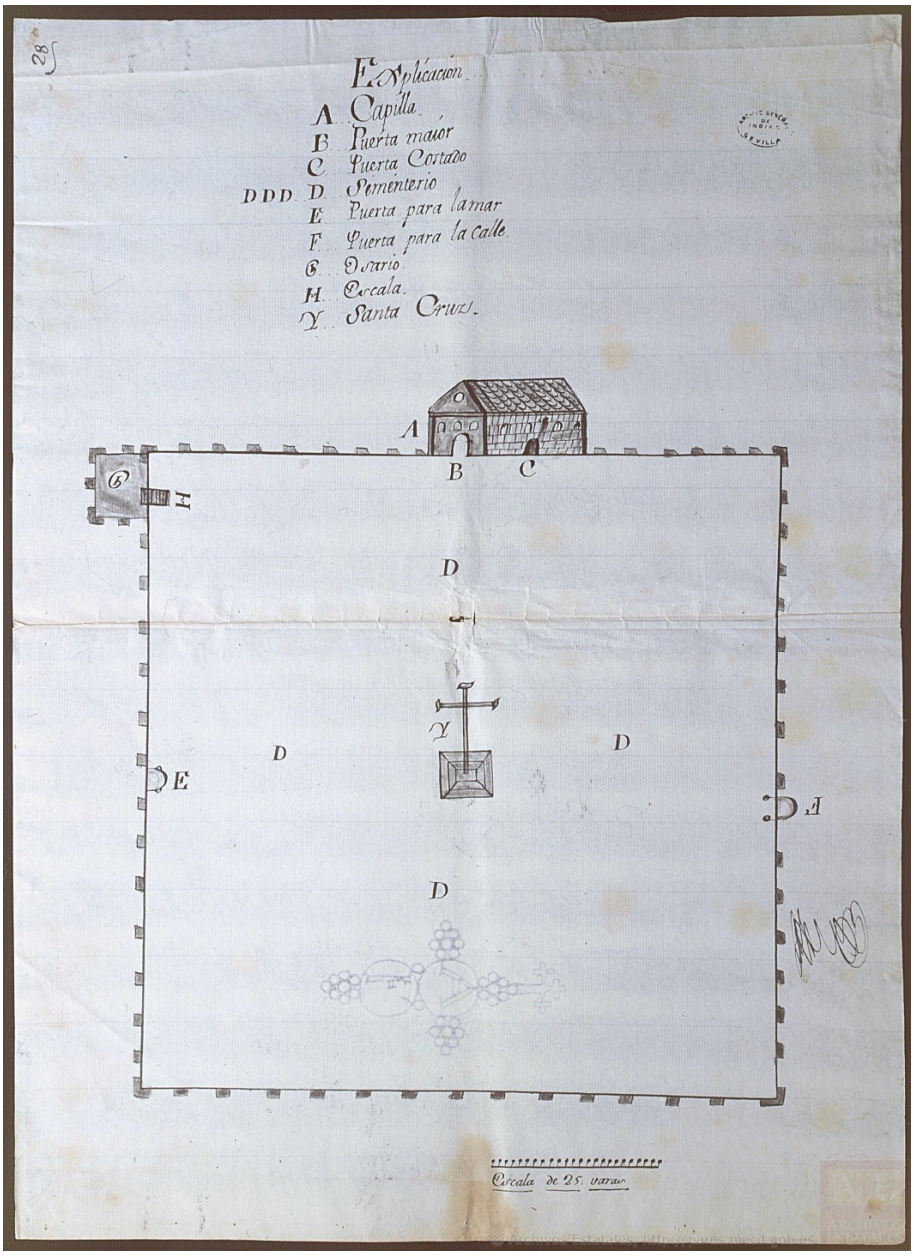


Figure 1. A 1793 cemetery plan for Manila
Source: AGI, MPD-FILIPINAS[37]

However, colonial lethargy characterized the first endeavors towards cemetery and burial reforms in the colonial capital much so that on 30 October 1792, Tejada suggested that the municipal councilors (*regidores*) be reprimanded for their indecisiveness and inaction. They

[37] AGI, MPD-FILIPINAS 213. Con presupuesto de Mariano Falcón, de 1792, incluido en 'Testimonio de las diligencias practicadas en virtud de Real Cédula sobre el establecimiento de un cementerio fuera de poblado, en donde se deben enterrar los cadáveres por las razones que expresa' (Manila, 6 de marzo de 1793), folio 28; anexo a carta nº 11 de Joaquín José Alonso de Tejada, fiscal civil de la Audiencia de Manila, a S.M, Manila, 22 de junio de 1793.

were also reminded that the aspiration for a new cemetery for the capital was inscribed in the royal pronouncements of the King to be adhered to in all the Spanish dominion. In the same report, he provided a state of the burial grounds in the capital citing the alarming state of three of burial sites in in the city: the graveyard beside the Hospital de San Lázaro, and the parish cemeteries of Tondo and Malate. He lamented the state of the graveyard within the enclosure of the Hospital de San Lázaro as its atmosphere was ¨continuously impregnated with malignancy as an effect of the exhalations and putrid effluvium that the corpses excrete¨. Tejada added that the presence of the cemetery did not only worsen the patients´ health but also weakened their spirit as they would incessantly ¨raise their *ayes* to heaven thinking that the same suffering from which they were trying to flee was coming to them, making them more distressed knowing that their illness has no other end but the day of death.¨[38]

Tejada was further alarmed that the two main burial sites in the city which were practically utilized for the interment of the cadavers after the 1789 and 1790 viral epidemics in the two sides of the Pasig river needed immediate reforms. He described the neglect and abandonment of the *campos santos* in Malate and Tondo that served as resting place both for the Spaniards and the natives who succumbed to the epidemic. He recounted that after the 13 December 1791 typhoon that brought the fences of the two cemeteries to the ground, he called the attention of the municipal government to immediately repair the collapsed structures that enclosed the burial grounds. Tejada added that the *alcaldes ordinarios* were ordered to instruct the *gobernadorcillos* to provide guards or *¨bantayes¨* to monitor the area. These instructions were noted on 20 December by Pedro Antonio de Escusa (alcalde ordinario), Don José Casal (regidor decano), Luis Hortigosa (regidor), José Domingo de Yruretagoyena (regidor) and Lorenzo de Burgos (regidor). Almost a year after, Tejada, in a mixed tone of frustration and desperation, reported that the bodies buried in the dilapidated and untended burial grounds of Tondo and Malate became foraging lands of filthy animals (*¨que los cuerpos sepultados allí se hicieran un pasto de animales inmundos¨).* Residents typically observed the area filled with dogs, birds and other roaming animals found to be disgustingly scavenging the open grounds where the mortal remains of those who succumbed to the epidemic were laid.[39]

These bothersome accounts did not translate to the colonial government´s urgent action to arrest an impending public sanitation crisis. It turned out that the cemetery plan that was proposed in 1791 was only made to comply in paper to the 1787 and 1797 royal decrees and to

[38] AGI, Ultramar, 521, Carta del Fiscal Tejada, 28 de noviembre de 1792.
[39] Ibid.

acquiesce to Tejada´s consistent prodding. The plan remained in the planning stage and no concrete steps were taken towards its execution thus reflecting the disinterested view of the municipal authorities and the prevalence of the strong opposition of the Religious concerning the matter. The resistance from the Religious, insufficiency of funds, and lack of resolve and sense of urgency on the side of Spanish civil administrators delayed, or even obscured, this important sanitary reform. Typical to other infrastructure endeavors in the colony, it took two more decades before concrete action was reinitiated.

Paco Cemetery: Manila´s first general cemetery

In 1814, the cemetery and burial reforms in Manila were resuscitated with the planned construction of an interment site away from the populous areas of the capital. Called the *Cementerio General de Paco* (or Cementerio General de Dilao)*,* the new burial ground of the capital was in the pueblo of Paco, a location still within the municipal radius but was considered as the city´s outskirt in the early nineteenth century. This was the most that the colonial administrators could do, on one hand attempting to implement the 1787 royal decree and on the other averting from antagonizing the religious and cultural sentiments of the Church and the believers. At first, the cemetery was only intended to serve as the resting place for the deceased of the walled city and Paco.[40] However, the insufficiency of cemeteries away from the centers of the arrabales of Manila resulted to its utilization for the mortal remains of Spaniards, Europeans, indios and mestizos who came from the different parishes within the municipal radius of Manila which included Binondo, Quiapo, San Miguel, Santa Cruz, Sampaloc, Tondo, Ermita, and Malate."[41]

The available archival materials on the construction of the Paco Cemetery leave us with limited information with regard the decision-making process on its materialization. However, a letter of Gov. Gen. Juan Antonio Martínez (1822-1825) on 9 February 1825 which reported the capital´s compliance to the 3 April 1787 and 27 March 1789 Royal decrees offer some details with regards its realization. According to Martínez, few towns in the Philippines, such as the Augustinian-administered towns of Pasig and Baliuag as well as Balanga, Abucay, and Orion, were reported to have had complied to the cemetery decree way earlier than the colony´s capital.

[40] *Reglamento para la policía y gobierno del cementerio general formado por el Excelentísimo Ayuntamiento Constitucional de Manila, 12 de abril de 1821.* Sampaloc, 1821.
[41] De Viana (2004), p. 93.

It took a very long time before colonial administrators in Manila made concrete steps towards the concretization of this sanitary measure. He expressed that at first, the previous authorities were not even thinking of erecting a new cemetery for the city, not only due to the difficulties of locating a suitable and useful site but also to the many obstacles that were raised against its realization. The priests in the capital argued that cadavers should be interred in the sacred churches and temples and not in fields or *campos,* since the latter ¨was only intended for the burial of heathens (*bestias*) and not for Christians¨ (*destinado para la sepultura de las bestias que para cementerio de los Cristianos*) and that ¨the act of conducting the deceased bodies outside of the towns or cities was no different to exposing them to the grazing birds and wild animals¨ (*sacar los cadáveres fuera de la población no es otra cosa que exponerlos a ser pasto de las aves y de las fieras*). Martínez further commented that the Church authorities even propagated the idea that the cemetery project was ¨too excessive and extravagant¨ and that it would have been better if the sum was used for other projects of more utility.[42]

The reluctance to change traditional and religious practices towards death and burial, the strong assertions against the new cemetery´s utility, the perceived lack of urgency, and deficiency of colonial funds resulted to the dissolution of the undertaking for more than two decades. From the first attempts of the municipal council in 1791 to 1793, the burial infrastructure was held at bay until 1814. Martínez attributed the resuscitation of the project to the renewed interest and dynamic composition of the city council which led to the approval of the project through a Superior decree on 6 May 1814. This was a crucial element that seemed lacking in the first propositions in the 1790s. The governor general noted that ¨the Constitutional City Council of the capital animated with a zeal for public interest, sought to perpetuate its memory by overcoming all the hurdles that long obstructed its realization, which thus gave birth to one of the most beautiful cemeteries ever known.¨[43]

By the end of 1814, the construction of the new city cemetery finally began. An 1818 plan of the cemetery which showed its elevation and profile was signed by a certain ¨Aragón¨ (perhaps by Ildefonso de Aragón, *comandante de ingeniero* of Manila) on January 31, 1823 as seen in Figure 2.

[42] AGI, Filipinas, 513, Acusa haber recibido y cumplido la Real Orden de 29 de enero de 1821 relativa a la erección de cementerios fuera de poblado y haberse erigido en la capital de aquellas islas uno magnífico campo santo según demuestra el plano que acompaña y dos ejemplares del Reglamento exponiendo por último que se van construyendo poco a poco en todos los demás pueblos por Juan Antonio Martínez, 9 de febrero de 1823.
[43] Ibid.

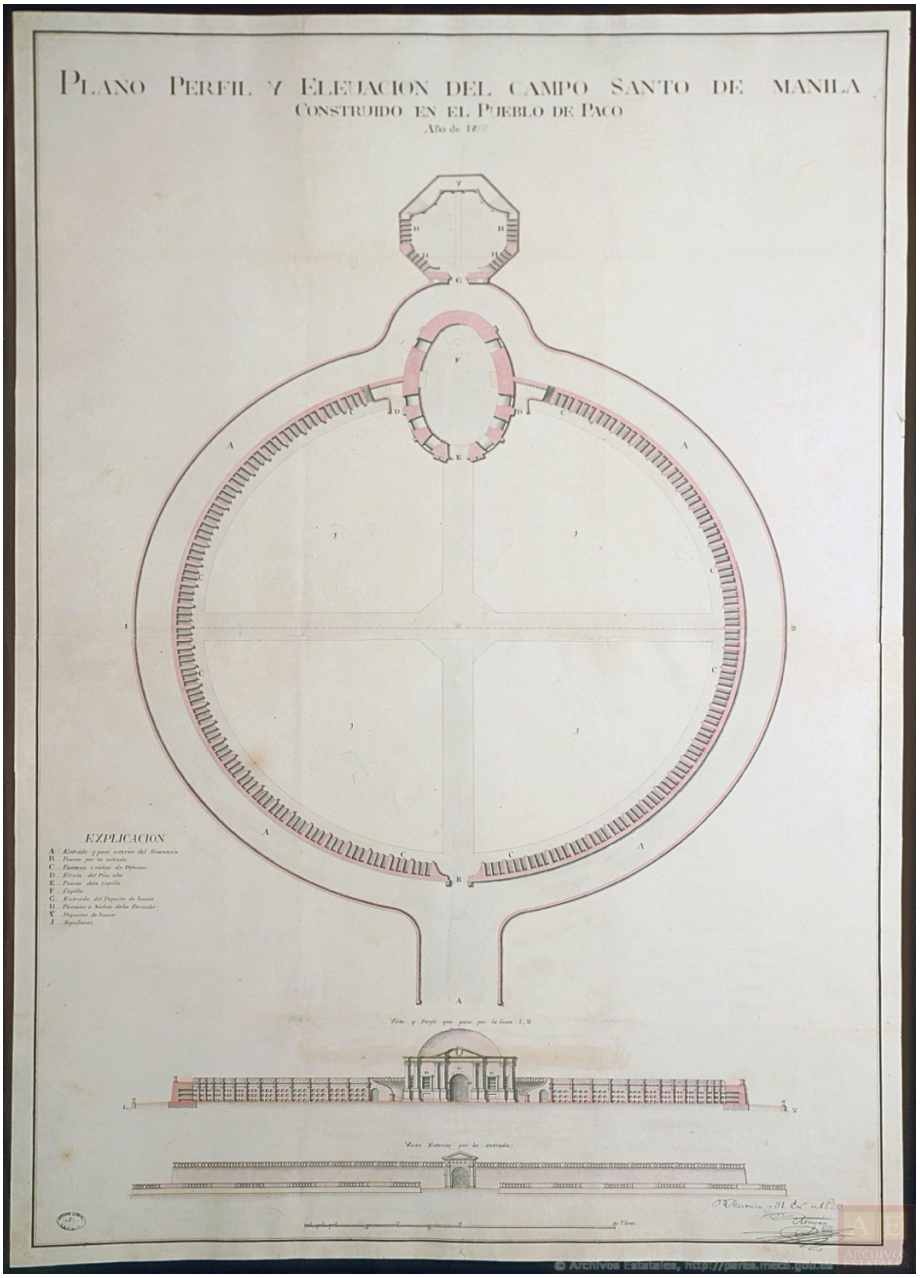


Figure 2. Paco general cemetery plan, 1818.
Source: AGI,MP-FILIPINAS.[44]

Laureano de la Cruz, chief master builder for the royal works (*maestro primero de las obras reales*) and Mariano Josef de Ocampo (*teniente delineador*) led the workforce of the Paco cemetery construction. A sample of a list of other individuals (Table 1) who were involved in the building of the *cementerio de extramuros* from the *ayudantes,* carpenters, up to the ordinary labourers and their compensation from 7 to 12 of November 1814 can be in Table 1.

[44] AGI, MP-FILIPINAS,135. ¨ Plano, perfil y elevación del Campo Santo de Manila, construido en el pueblo de Paco. Año de 1818¨, 1 de enero de 1823.

Name	Position	Wage (7-12 November 1814)
Don Seferino Zapata	ayudante	4 reales
Don Sixto Velásquez	ayudante (maestro de fortificación)	4 reales
Alexo Capili	carpenter	2 reales and 6 granos
Manuel Baustista	carpenter	2 reales and 6 granos
José Zapata	timekeeper and wages clerk and guard	3 reales
Sabino Casas	labourer	1 real and 6 granos
Rafael Inocencio	labourer	1 real and 6 granos
Ligino Santos	labourer	1 real and 6 granos
Luciano Manuel	labourer	1 real and 6 granos
Roquino Pablo	labourer	1 real and 6 granos
Dionisio Lacsamana	labourer	1 real and 6 granos
Eustaquio Gonzales	labourer	1 real and 6 granos
Pedro Mauricio	Labourer	1 real and 6 granos
Andrés del Rosario	labourer	1 real and 6 granos
Mariano Sali	labourer	1 real and 6 granos
Félix Layog	labourer	1 real and 6 granos
Juan de los Santos	labourer	1 real and 6 granos
Bernardo Santos	labourer	1 real and 6 granos
Genancio Inocencio	labourer	1 real and 6 granos
Remigio Florentino	labourer	1 real and 6 granos
Pedro José	labourer	1 real and 6 granos
Antonio de los Reyes	labourer	1 real and 6 granos
José Espinosa	labourer	1 real and 6 granos
Meregildo Santos	labourer	1 real and 6 granos
Francisco Ildefonso	labourer	1 real and 6 granos
Remigio Inocencio	labourer	1 real and 6 granos
Claudio de la Rosa	labourer	1 real and 6 granos
Felipe de los Santos	labourer	1 real and 6 granos
Cándido Casas	labourer	1 real and 6 granos
Justo Mariano	labourer	1 real and 6 granos
Dionisio Herena	labourer	1 real and 6 granos
Domingo Mesa	labourer	1 real and 6 granos
Teodoro Mariano	labourer	1 real and 6 granos
Gregorio José	labourer	1 real and 6 granos
Julián Ambrosio	labourer	1 real and 6 granos
Nicomedez de San Juan	labourer	1 real and 6 granos
Gregorio Capili	labourer	1 real and 6 granos
Simón Flores	labourer	1 real and 6 granos
Juan Guido	labourer	1 real and 6 granos
Matías Ortega	labourer	1 real and 6 granos
Doroteo Guevara	labourer	1 real and 6 granos
Nasario de la Cruz	labourer	1 real and 6 granos
Mariano Amador	labourer	1 real and 6 granos
Mariano Valentino	labourer	1 real and 6 granos
Manuel Gonzales	labourer	1 real and 6 granos

Antonio Reyes	labourer	1 real and 6 granos
Valentín Cabrera	labourer	1 real and 6 granos
Felipe Cabrera	labourer	1 real and 6 granos
Venancio Inocencio	labourer	1 real and 6 granos
Remigio Inocencio	labourer	1 real and 6 granos
Ramon de la Cruz	labourer	1 real and 6 granos
Pedro Tavol	labourer	1 real and 6 granos
Vicente García	labourer	1 real and 6 granos
Table 1. Names of individuals involved in the construction of Paco cemetery, 1814 *Source:* AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1190436.[45]		

Aside from these individuals, deserters, exiles, and prisoners were also part of the work force. The exiled Sargento Cornelio de San Antonio was paid two reales each day. Two deserter *cabos* who were unidentified were paid 6 granos while thirty-three deserter soldiers were paid three granos each. Archival documents show that the biggest contingent of laborers in the cemetery construction came from the prisoner workers. From 7 to 12 November 1814, a total of unnamed 129 prisoners served as laborers and were paid 6 granos each.[46]

The primary material used in the construction of the cemetery was stone block or *sillar* The authorities acquired these materials from private individuals who served as contractors. For instance, in October 1814, the government paid three contractors for providing stone from Guadalupe in San Pedro de Macati (present day Makati). As in many public works projects, this provided opportunity for the Chinese businessmen to engage in this profitable endeavor. A certain Chinese named Clemente (*el chino Clemente*) provided *sillares de Guadalupe* worth 25 pesos, a certain Chinese named Domingo (*el chino Domingo*) delivered the same material amounting to almost 9 pesos, and Don Antonio Aniceto who was paid 3 pesos.[47] (See Appendix Chapter 3, A)

Displacement of several private individuals and their properties is a recurrent theme in the colonial public works projects. In the case of the Paco cemetery, the government stated that proper payment was made to the different individuals whose lands and houses were expropriated for the new burial ground of the capital. As mentioned, the lands in the arrabal of Paco was considered the capital´s outskirt until the mid-nineteenth century. There were few

[45] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1190436, Obra del cementerio extramuros de la Plaza Relación por la que se demuestra los jornales y gratificaciones devengadas por los operarios, gastadores y empleados en dicha obra, 12 de noviembre de 1814.
[46] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1190436. ¨Relación por la que se demuestran los gastos causados en la referida obra del 31 de octubre al 5 de noviembre de 1814¨.
[47] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1190436. ¨Obra del cementerio extramuros de la Plaza. Relación de los jornaleros, materiales y demás gastos que debe satisfacer el Ayuntamiento Constitucional de Manila¨. 23 de noviembre de 1814.

houses and rice fields formed a big part of this settlement. When the government decided to construct the new cemetery in the barrio of Paco, it had to pay at least four individuals for expropriating their houses and rice fields which eventually constituted the new cemetery´s grounds. According to De Viana, the new cemetery of the capital was built on a land owned by Juan Blanco Bermúdez.[48] Unfortunately, microfilmed records about this purchase is unavailable so no additional information could be presented in this study. However, archival records document four other transactions that the government undertook to secure the land of the new burial site. Don Justo Gregorio and Don José Gregorio received 21 pesos and 19 pesos respectively as payment for taking out a portion of their rice lands which were contiguous to the land area of the Paco cemetery. Don Justo Gregorio´s land was reported to yield 43 cavans of palay. Meanwhile, Don José Gregorio was paid not only for his rice land but a portion of his house that had to be removed. However, a native named Rafael del Castillo and a native woman Lucia de los Reyes were ordered to abandon their houses to give way to the construction of a storage house for the construction materials of the cemetery. Records show that del Castillo and de los Reyes were only paid one peso each by the government. No mention was made these natives expressed discontent or disagreement with this arrangement. In many cases, expropriation of lands and properties to give way to public works projects resulted to disputes as reflected in the other chapters of this study.[49]

The 1820 cholera epidemic and the precipitated opening of Paco cemetery

The unhurried construction of the Paco general cemetery caught the colonial government unprepared for the numerous deaths brought by the 1820-1823 cholera epidemic that swept the capital. Governor General Martínez reported that the epidemic cholera which hit the city after the October 1, 1820 strong typhoon left Manila and its nearby towns with numerous fatalities. The cholera disease was ¨swift and lethal¨. Victims were ¨dying too fast that it was almost impossible to keep up with the burials in the small parish cemeteries¨ in the different arrabales such as in Binondo, Santa Cruz, Tondo and Malate.[50]

Official sources at that time did not provide a single official account of deaths but the peak of fatality rate could have been between October to November 1820 which tallied a total

[48] De Viana, p. 92.
[49] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1190436. ¨Obra del Cementerio Extramuros de la plaza. Relación de los jornaleros, materiales y demás gastos que debe satisfacer el Ayuntamiento Constitucional de Manila¨, 25 de octubre de 1814.
[50] De Bevoise (1995), p. 173.

of 32,879 deaths as belatedly reported by then governor general Mariano Fernández de Folgueras in November 1821.[51] Colonial officials believed that aside from the cholera outbreak, the spike on the fatality cases could also be attributed to ¨the atmosphere overloaded with harmful vapors due to the strong typhoons that hit the capital on 1 October 1820¨. This attribution inarguably resonated the strong influence of the miasmatic idea on the origin of diseases. According to the authorities, the natives were also to be blamed for the high mortality and spread of the diseases because of their strong reluctance and repugnance in receiving medical attention and observance of hygienic and sanitary measures.[52] Apart from these initial death tally and ground reports, the government no longer provided a detailed account on the severity of the situation per arrabal, town, or province until the following year from February to the first week of August 1821. Nevertheless, one important thing was certain for the authorities. The unprecedented magnitude of the catastrophe and the continuous unfortunate events led to the precipitated opening of the new general cemetery of Manila in the suburb of Paco for the burial of those who succumbed to the cholera epidemic before the construction of the graveyard could even be totally completed¨[53].

The following year, the epidemic continued to sweep Manila and its nearby towns and provinces as shown in the government´s report on the mortality incidence from February to the first week of August of 1821. Colonial records documented a total of 9,728 deaths at the time. Table 2 demonstrates the thousands of cholera-related deaths that were recorded in the suburbs of Tondo, Binondo, Santa Cruz, Quiapo, Sampaloc, San Miguel, Dilao, Ermita, and Malate and Pasay. Among these territories, Tondo and Binondo registered the highest fatality cases with Sampaloc with the lowest number of deaths.

	Tondo	**Binondo**	**Santa Cruz**	**Quiapo**	**Buena Unión and Sampaloc**	**San Miguel**	**Malate y Pasay**	**Dilao**	**Ermita**
Deaths recorded from previous periods before	945	659	334	305	170	92	347	334	375

[51] AGI, Filipinas, 513, El Gobernador General Jefe Político Superior interino de Filipinas acompaña con un resumen general los estados demostrativos de los fallecidos a causa de la epidemia de cólera morbo desde el día de 3 de octubre de 1820 hasta 17 de noviembre de este año. Mariano Fernández de Folgueras, 23 de noviembre de 1821.
[52] Ibid.
[53] De Viana (2004), p. 93.

February 1821									
February 12	14	8	2		5		5	1	4
February 19	14		3				4	9	
February 26	25	5	5		1		6	3	1
March 5	10		2				2	2	
March 12	8	10	6	1			3	2	1
March 20	10	5	3				4	3	
April 2	7	8	12	1	3	5	8		2
April 9	13	7	16	2	1	5	1	2	1
April 16	12	19		3	1		3	1	
April 25	11	17	5	2	1			4	
May 4	14	7	11	2	3		1	1	
May 7	3	16	3		2	1	2		
May 14	13	12	2	2			1	4	1
May 21	18	5	7					1	
May 28	7	1	1						
June 4	1	3					1		
June 18		3							
June 26	3	3	1			1			
July 2	5	3						1	1
July 9	4	4	1				1		
July 16	3	3	2		1	1			2
July 23	3	5	2	1	1		1		6
July 30	3	4	1				1		
August 5	4		3	1	1		20	1	5
Total Deaths	1150	807	422	320	190	105	411	369	399

Table 2: Cholera-related deaths recorded in the arrabales of Manila in the first half of the year 1821
Source: AGI, Filipinas 513.[54]

Aside from these numbers, other contiguous towns of Manila also documented high cases of fatality during the aforementioned periods: San Pedro de Macati (153); Parañaque and Malibay (550); Las Piñas (93); Pasig (882); Pateros (253); Taguig (385); Muntinlupa (70); Mariquina (247); San Mateo (176); Cainta (162); Antipolo (88); Bosoboso (8); Taytay (347); Caloocan (109); and Navotas and Tambobong (1539).

[54] AGI, Filipinas, 513. ¨Estado que manifiesta los Individuos que han fallecido en la provincia de Tondo de la cólera morbo según los partes dados por el Alcalde Mayor de dicha provincia, Manila¨. 14 de agosto de 1821.

Like the other public works projects, the cemetery became a site of surveillance that was governed by a series of norms and regulations. With Paco´s opening, the first set of rules and norms for the proper use and administration of a cemetery in the colony was promulgated on 12 April 1821 by the city council of Manila (*Reglamento para la policía y gobierno del cementerio general formado por el Excelentísimo Ayuntamiento Constitucional de Manila*). A supplementary decree was again promulgated the following year on 5 February 1822. The *Reglamento para la policía y gobierno del cementerio general* which consisted of thirty-eight articles systematized the cemetery management not only towards the establishment of a hygienic, ordered, and controlled gravesite but also to its municipalization. For instance, the designation of specific cemetery personnel composed of the cemetery inspector (inspector), *capellan mayor, sacristán, mozos sepulteros,* and *cocheros* and the codification of their duties and regulations were vital in the surveillance mechanisms of the burial ground. It was under the city council´s power to appoint a cemetery inspector who would serve as the principal overseer of the proper use, management, and good state of the burial grounds. The cemetery inspector was at the same time a member of the city council of Manila. Meanwhile, the cemetery priest was appointed by the Archbishop of Manila through the recommendation of the city council. The funds that were used in the construction and maintenance of the general cemetery also came from the city treasury.[55] All the other personnel were also under the appointment of the city council.

Regulating and Managing the Paco Cemetery

The *Reglamento´s* specific instructions on how interments should be done reflected the authorities´ efforts of codifying the accepted burial practices based on the precepts of public health and hygiene. It could also be argued that the instructions led to the introduction of a more methodical and systematic process of documenting and profiling the dead. Like in the slaughterhouse, a routine had always to be followed. All burials were only allowed from 7:00 o´clock in the morning to 5:00 o´clock in the afternoon, only allowing the authorized burial carriages to enter the cemetery premises. The bearing of the dead on the shoulders, a practice that was observed by most natives, was prohibited due to sanitary reasons. Then, the cadaver would have to be transported to the cemetery chapel for the proper religious rites to be administered by the cemetery priest. The municipal authority specified that all sacred rites in

[55] *Reglamento para la policía y gobierno del cementerio general formado por el Excelentísimo Ayuntamiento Constitucional de Manila, 12 de abril de 1821.* Sampaloc, 1821.

the cemetery should be uniform to all persons (*sin distinción ni privilegio*). On the other hand, specific locations for the burial of the deceased children (ossuary) and the Dominican religious due to their help in responding to the 1820 epidemic were designated in the cemetery grounds. All deceased should be properly documented in the burial registers (*partidas de entiero*) of the cemetery.[56]

Meanwhile, gravediggers-guards were required to be in constant watch in order that proper inhumation was carried out and that sanitation norms were rightfully observed. Pits should be 7 feet long, 2 feet wide, and 8 feet deep and coffins should be properly and completely covered and sealed. The mortal remains should also be interred within 24 hours. A permit should be ensured if the burial would exceed beyond these hours and guaranteed that the caskets be hammered. To free up some space in the cemetery, niches were cleared every after three years while exhumation of bones were done every after two years. Before niches could be cleared, a small cavity would have to be opened first for three days to release the harmful vapors. After this period, only then that the walls of the niches could be opened. A permit from the city´s *Junta de Sanidad* was also necessary before this could be undertaken so as to preserve the public´s health. Furthermore, the city council prompted the cemetery inspector to carry out steps to improve the cemetery´s cleanliness and ornate through the cultivation of aromatic herbs in the patio, the planting of lush trees in the surroundings that ¨would absorb the miasmatic putrefactions and purify the air¨, the opening of wells for the washing of the cemetery grounds especially during the dry season, and all other measures ¨to make it a pleasant and healthy place of rest for our ashes and those of our children and brothers¨ (*que sea grato y saludable el sitio donde reposarán nuestras cenizas y las de nuestros hijos y hermanos*¨).[57]

While the municipal authorities aimed for the observance of these norms for the sanitary and orderly disposal of the dead, some of these policies proved to be disadvantageous to the socio-economic realities of the many residents of the capital, most especially the natives. Burial charges were inaccessible for the masses as inhumation in niches amounted to 16 pesos. Meanwhile, the continuous use of these niches amounted to 300 pesos.[58] The use of burial carriages also meant additional expenses for the natives. It was not surprising then that many burials occurred beyond the regulation of the colonial authorities as the natives tried to evade these further burden. Moreover, the novel idea of filling up the niches and eventually opening

[56] Ibid.
[57] *Reglamento para la policía y gobierno del cementerio general formado por el Excelentísimo Ayuntamiento Constitucional de Manila, 12 de abril de 1821.* Sampaloc, 1821.
[58] *Adiciones al Reglamento del Cementerio,* 5 February 1822.

and clearing them to remove the deceased person´s bones and other remains, to make room for others was a practice that provoked revolting objection as it brought discomfort to the religious and traditional sensibilities of Manila´s residents.

Since its hastened opening in 1820, the general cemetery of Paco served as Manila´s main burial place. While the *Reglamento* of 1821 originally explicitly stated that the cemetery was for the exclusive use of Intramuros and Dilao/Paco only, the burial conditions of the different arrabales of Manila led to the utilization of the Paco cemetery for the rest of the suburbs. Paco cemetery had to be opened to all arrabales as the civil authorities intensified its campaign against the use of the graveyards beside or inside the suburbs´ churches. Also, the growing number of inhabitants in the capital necessitated a bigger resting place for the dead.

After its erection, the Paco cemetery became an image of architectural interest which evoked ¨structural elegance and ornate¨ for the capital.[59] For instance, the 1820s description of an Englishman of the cemetery´s ambience and architectural style would help us reimagine this elegant and unique burial infrastructure:

> On the road leading to the village of Santa Ana is the cemetery, a building well worth the attention of strangers both as a novelty in itself, and as in some measure redeeming the character of the architecture of this country from its general want of interest and symmetry. It consists of two concentric circular walls, about ten feet apart and fourteen in height, both surmounted with a balustrade. The inner wall forms the periphery of a circle of about 250 feet in diameter, and is pierced with three rows of small semicircular arches, which form the entrances to as many arched, oven-like receptacles, formed in the space betwixt the walls, and of a size just calculated to receive a coffin, to which purpose they are appropriated. There are from two to three hundred of those receptacles; and when occupied, the entrances are walled up. The plot of ground in the centre is crossed by two broad stone walks, the borders of which are planted with flowers and shrubs; the remaining space is used for interments.
>
> On the further side from the gate, and joined to the wall, is a handsome chapel of an oval shape, the roof being a dome. The interior of this chapel is remarkably neat; and the altar, which is white, and gold, is particularly so, from its elegant simplicity and chasteness of ornament: on each side of it are repositories for the remains of governors and bishops. Without are flights of steps leading to the terrace joining the walls, and two passages leading to a smaller building at the back of the chapel, and in the same style as the large one. This is called the "Angelorio" and a recess in it the "Ossario." The first is appropriated to the remains of infants and children, and the last to the bones which may in time accumulate. **[60]**

[59] Sir John Bowring, *A Visit to the Philippine Islands* (London: Smith, Elder, and Co. 1859), p. 14.; John Foreman, *The Philippine Islands: A historical, geographical, ethnographical, social and commercial sketch of the Philippine Archipelago and its political dependencies* (London: Sampson Law, 1890), p. 180.; *Manual del Viajero*, p.86.
[60] ¨Accounts of an Englishman, Remarks on the Philippine Islands and on their Capital Manila, 1819 to 1822¨ in Blair and Robertson (1903-1907), vol. 51, pp. 172-173.

However, the image of a sanitary, well-kept, and orderly necropolis could not be applied to Paco cemetery for the entirety of the nineteenth century. In time, the intensifying urbanization and increasing demography of the capital saturated the limited capacity of the graveyard. Worse, horrific sights and smell of agglomeration, decay, and putrefaction swathed the burial grounds most especially during the 1860s and 1880s as the capital grappled with cemetery and burial crises due to the high mortality rates brought by the cholera epidemics and other catastrophes.

The Cemetery Crisis of the 1860s: The long arduous search for a new place for the dead

On 20 July 1864, the municipal government of Manila initiated the plan of building a new cemetery as urban residents realized the growing problems of sanitation brought by the Paco cemetery. For the previous decades, almost all suburbs in the capital such as Binondo, Quiapo, San Miguel and even the farther areas of Tondo, Santa Cruz, and Sampaloc buried their dead in the general cemetery of Paco. Naturally this resulted to the pernicious effect of an overly excessive utilization of the cemetery. The agglomeration aggravated due to the series of cholera epidemics that swept the entire capital.[61]

In search of new lands: Another recipe for a cemetery crisis

During the first decades of the nineteenth century, the suburb of Paco/Dilao seemed to be the ideal location for a new general cemetery within the municipal radius of Manila. The less populated and inhabited areas to the left of the Pasig river provided reprieve to the dangers of the miasmatic vapors that were associated with the cemetery. The two other suburbs of Ermita and Malate also had small population so agglomeration was not seen as an impending risk. This was not the case of the suburbs to the right side of the Pasig river were the more densely occupied and bustling suburbs of Binondo, Quiapo and Santa Cruz were located. Meanwhile Tondo and Sampaloc were home to an increasing number of native settlements.

However, the colonial administration implemented a land and space use policy by the first half of the nineteenth century that created or aggravated the sanitary problems as it contradicted the ideal lay out and zoning of the city. The rapid urbanization and increased population growth of the city brought an array of urban problems for the residents. An increase

[61] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, 1868- 1882.

in the number of inhabitants in the capital signified an increased demand for space especially in the commercially-vibrant suburbs on the right side of the river. Congestion, unsanitary streets, and fires due to overcrowding became typical problems of the arrabales. The colonial government repetitively enumerated the high incidence of fires, especially in the areas where houses were made of very light materials. The natives who were known for constructing their houses made of combustible materials like bamboo, nipa, and *cogon* were prohibited from erecting their abodes near the government and military structures in the suburb. As solution, the colonial administration limited the occupation of more lands to the right of the river (especially near government edifices) and encouraged the settling or resettling of residents on the opposite bank of the Pasig river ¨where there are plots of considerable extent that are still uninhabited and of little value¨.

The colonial government thought that this move to the other side of the river was the best solution to solve the increasing issue of overpopulation, congestion, and scarcity of space in the capital, notwithstanding the presence of the *Cementerio General de Dilao/Paco* in this side of the municipal territory. This zoning solution was also presented by the colonial government despite the fact that almost 2/3 of the total number of cadavers in the city were interred in this cemetery. Indeed, the left side of the Pasig river was converted as the expansion site for the capital´s growing problem of space and housing. Soon enough, the once-isolated general cemetery of Paco was encircled by growing settlements.

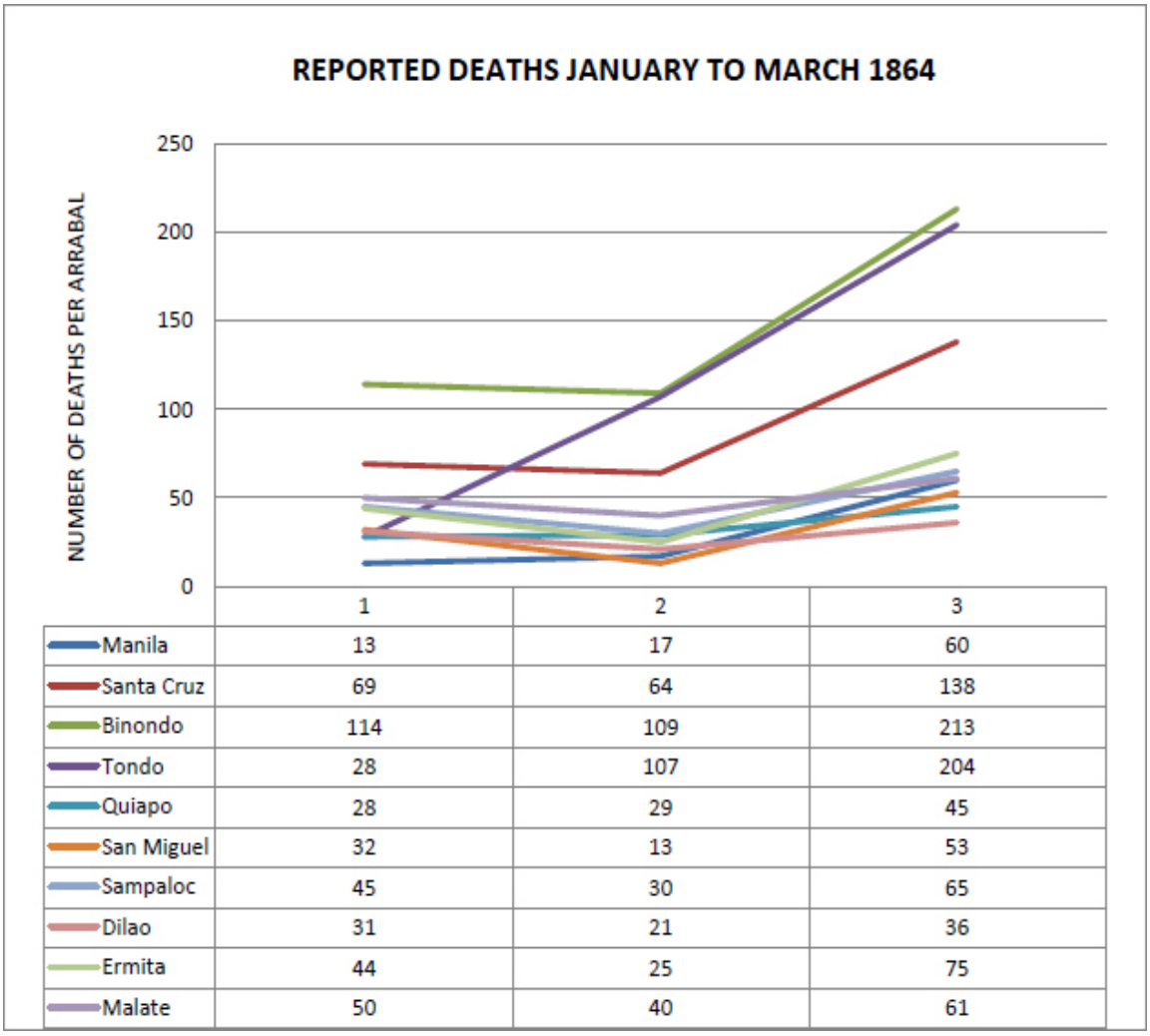
The government´s assumption that there were no serious implications to this measure was proven wrong when two calamities struck the Luzon island in 1863- the June 1863 earthquake and the October 1863 cholera epidemic. The government´s foresight was put to the test when the series of epidemics and disasters resulted to the thousands of deaths in the capital. In an instant, Paco cemetery reached its saturation point. It could no longer accommodate additional cadavers from Intramuros and the different suburbs of Manila. Its insufficient burial space resulted to improper inhumations and gathering up of deceased bodies in the graveyard. For most of the latter part of 1863, the area was reeking of death and decay that residents complained that the vicinity was already completely intolerable.

Many residents who tried to rebuild their lives and homes in the less-dense suburbs to the left side of the river expressed their concerns and fears as the stink of illeness and death loomed over their neighborhoods. The idea of rebuilding was put to the test as these new communities were exposed to the everyday scene of numerous burials:

¨ but after the people´s great sacrifices to obtain a proper house of their own, a second scourge added to their affliction, because they found themselves with the sight of endless passage of corpses in front their houses which did not only deteriorate the value of their new settlements but posed serious danger to their health. ¨[62]

With this new context, the struggle for space between the living and the dead took place. When cholera-deaths continued to rise in the first quarter of 1864, the crisis of finding a resting place for the dead continued. Manila governor Estanislao Vives reported the number of deaths per arrabal on the months of January to March (See Appendix Chapter 3, B for the table). The data provided by the government, when graphed, show that Tondo where the highest concentration of natives resided and the dense and agglomerated suburbs of Binondo and Santa Cruz registered the highest fatality incidence as seen in the graph below. (See Figure 3)

[62] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Regidor Vicente Carranceja, 20 de julio de 1864.



	1	2	3
Manila	13	17	60
Santa Cruz	69	64	138
Binondo	114	109	213
Tondo	28	107	204
Quiapo	28	29	45
San Miguel	32	13	53
Sampaloc	45	30	65
Dilao	31	21	36
Ermita	44	25	75
Malate	50	40	61

Figure 3. Reported deaths from January to March 1864.
(Columns 1, 2, and 3 represent the deaths for the months of January, February, March 1864 respectively.)
Source: Costelo, 2020. Elaborated by using the data from *Gaceta de Manila*, 4 June 1864.[63]

The first commission

On 20 July 1864, these alarming images of the cemetery as well as the increasing pleas of the residents were reported by then cemetery inspector and councilor (*regidor*) Vicente Carranceja to the Manila city council. The city council´s undeniable intention to foment the city´s good governance and public ornate (*buen gobierno y ornato público*) resulted to its proposal to then Governor General Rafael de Echagüe to order the isolation of Paco general cemetery, the prohibition of burial other than those coming from the barrios of Paco, Malate, Ermita, and Intramuros, and the improvement of the physical aspect of the graveyard by

[63] ¨Informe de Estanislao Vives, gobernador de Manila¨, *Gaceta de Manila*, 4 de junio de 1864.

planting trees around it. More importantly, Carranceja and the city council prompted the superior colonial government on the urgency of constructing a new cemetery with a bigger capacity than Paco which will only cater to the needs of the suburbs to the right of the Pasig river. Carranceja recommended the use of an elevated land near the road leading to the exit of Sampaloc, a location which was considerably distant from the public roads and the Pasig river.[64] On 29 July 1864, this proposal led to the drafting of a blueprint by then municipal architect Luciano Oliver amounting to 30,000 pesos. However, this proposal was problematic because it lacked the necessary construction specifications that were crucial for the materialization of the project.

On August 6, 1864, city councilors Vicente Carranceja and Marcelo Ramírez presented to the city council three matters concerning the new cemetery project. First, they urged that the matter should be elevated to the Treasury to determine the budgetary concerns of the construction. They proposed that the construction be made through public bidding and that the duration be no more than three years. Second, they presented their findings on the plausible location of the new cemetery. By this time, two ¨*lomas*¨ or ¨elevated sites¨ were mentioned as possible sites. The first was the elevated land near the road towards Mariquina (present day Marikina) while the second was the hill in San Lázaro near the Chinese cemetery.[65]

These hilly parcels of land were already identified as ¨lomas¨ or hills in the maps produced in the early nineteenth century. For instance, the 1814 map below (See Figure 4) shows the vast parcel of bare hilly lands that belonged to Sampaloc, Santa Mesa, and Tondo. By the second half of the nineteenth century, this area served as the northern frontier to the bustling arrabals of Tondo, Santa Cruz. Quiapo, and Sampaloc. In search of other possible locations, the government turned its attention to this site where the Chinese cemetery was also located. The cemetery appeared in documents as *La Loma Chino.* The cemetery, which consists of an area of more than 40 hectares, was located in a hill a few kilometers away from the capital. The authorities deemed this important because the spot´s elevation would provide the ventilation necessary in a new burial site. These factors, aside from its distance to the capital, convinced the colonial government that the site offers the best conditions for a new burial place of the capital.¨ The colonial administration arranged to cover the costs of expropriating a 12-hectare rectangular land next to the *La Loma Chino* to be utilized in the burying of the dead,

[64] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Regidor Vicente Carranceja, 20 de julio de 1864.
[65] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila¨. Informe de Regidor Vicente Carranceja and Marcelo Ramírez, 6 de Agosto de 1864.

especially those who died in the epidemic. The government envisioned that with this new burial site, the other cemeteries in the different suburbs could already be closed leaving the general cemetery of Paco for limited cases of burials in niches.[66]

Figure 4. Map of Manila showing the *lomas*, 1814.
Source: AGI, MP-Filipinas 133[67]

According to the two councilors, two steps should be made: it was fundamental to create a commission that would involve the expertise of two medical professionals to properly study the suitability of the two proposed sites; and, if the second site would be chosen, several steps should be done to take into account the customs of the Chinese while maintaining the municipal interest. They recognized that joining the new Catholic cemetery almost beside the Chinese cemetery would mean less costs. However, they were quick to recommend that the two cemeteries should be separated by a means of a wall with the two burial grounds having their own principal gates and security personnel. The need for security (*cuadrilleros*) was imperative since repeated cases were reported of thieves swarming in the area. Third, the councilors appealed to the superior government of the islands that once a new cemetery be opened, the

[66] AHN, Ultramar, 501, Exp. 3, Carta del ayuntamiento de Manila, 16 septiembre de 1882.
[67] AGI, MP-Filipinas, 133, Plano de la Plaza de Manila y sus Contornos por Ildefonso de Aragón, comandante de ingenieros, 4 de enero de 1814.

government would order the closure of the cemeteries of Santa Cruz, Tondo, and Sampaloc that were reported to be in their worst conditions.[68] The councilors also recommended the establishment of interior divisions and compartments in the new cemetery to be leased or sold that would considerably increase the funds of the municipal government. Two days after the city council´s session, medical doctors Quintin Meynet and Enrique Suender and members of the *Subdelegación de Medicina y Farmacia* were appointed as members of the commission alongside city councilors Carranceja and Ramírez on 8 August 1864.

After more than a month of reconnoitering and examining the various possible locations for the new cemetery, the commission submitted its report to the city government of Manila. The report reflected the most important factors that should be considered in evaluating the proposed site. These included: (1) land elevation, slope, and inclination (2) soil type (3) distance from the population, principal roads, and water sources and (4) wind movement. Considering these elements, the Commission reported that there were only two sites to the right of the Pasig river that met the appropriate conditions for a general cemetery. The two sites only reaffirmed the two initial proposed locations of Ramírez and Carranceja. The first site that was studied was the hill in San Lázaro (*Loma de San Lázaro*) where the Chinese cemetery was situated. The second was a hill located to the left of the road leading to San Juan del Monte which was about 15 minutes away from the border of Sampaloc. According to the Commission,

> Indeed, both sites are elevated and slightly inclined. They are quite secluded from the populace and the main roads. The sites are also distant from streams, rivers, springs, river bed, conduits or pipes that lead to the water source, especially for the drinking needs of men and animals.[69]
>
> *Efectivamente, ambos terrenos son elevados, ligeramente declives, bastante separados de grupos de población y de caminos reales y lejos también de arroyos y ríos que puedan salir de cauce de manantiales, conductos o cañerías que conduzcan aguas potables para hombres o animales.*

Interestingly, the report also reflected one of the primary concerns of sanitary reformers at the time. The belief that illnesses moved through air because disease-causing miasmas rests and moves in the air was a dominant epidemiological precept for the commission. They cited that it was necessary to examine the prevailing winds in Manila and its environs in relation to the two proposed locations. They reiterated the standard practice of building cemeteries leeward of the prevailing winds. Upon examination of the shifting winds, the commission said that this

[68] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Regidor Vicente Carranceja and Marcelo Ramírez, 6 de agosto de 1864.
[69] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de la Comisión, 30 de agosto de 1864.

rule did not apply to the case of Manila since the city and its suburbs were sheltered with almost the same movement and duration of monsoon winds from the 1st and 4th quadrant and the 2nd and 3rd. Applying this rule to the two proposed locations, the Commission said that there was no reason to give preference to one site over another by reason of its exposure to the winds.

With all these considered, the Commission gave two reasons why *La Loma San Lázaro* was the preferred site over the other. First, the terrain of *la loma de* San Lázaro is sandier compared to the other. Second, the proposed location near San Juan del Monte and Sampaloc would cause inconvenience to the many suburbs in the city. Its extended distance from the populated suburbs of Tondo and Binondo would signify that all corpses from these areas would have to pass by the street of Escolta, enter the suburb of Santa Cruz, traverse the main road of Quiapo, San Sebastián road, and Alix Street. Conducting mortal remains in such a manner would not only mean exhaustion to the families and loved ones who were accompanying their dead to the final resting place but would also mean exposure of the residents of almost all suburbs to the right bank of the Pasig river to countless death processions and various sanitary risks. On the other hand, the *la loma de* San Lázaro´s proposed location was an area that was relatively equidistant to the suburbs situated on the right side of the Pasig river. Cadavers from the suburbs of Tondo and Binondo would be led through the Trozo road; corpses from Santa Cruz and Quiapo would pass through the Dulumbayan road, and dead bodies from the northern side area of the city consisting of San Sebastian and Sampaloc could use as passageway the Bilibid road. The Commission believed that in this manner, residents were not vulnerable to the many health risks that corpses carry while they were being moved from the houses and to their final resting place.[70]

Aside from selecting the most appropriate site, the Commission also recommended the necessary works and improvements in the physical design and composition of the new cemetery and its immediate environment. For instance, the plan must indicate that the new cemetery should have a slope of at least two percent and should include suitable drain-holes and gutters to facilitate drainage most specially during the rainy season. It also suggested that a study be made that would determine the number of deaths in the capital for the last five years. These numbers should serve as reference for the municipal government to build a cemetery with a capacity enough to contain the number of corpses in the last quinquennium without the need of exhumation.[71]

[70] Ibid.
[71] Ibid.

Aside from a mortuary, the new cemetery should include a judicial autopsy room (*sala de autopsias judiciales*) with a marble table and the necessary accessories. The walls of this room must not exceed 12 feet in height and the roof should be in a form called ¨half-water (*media agua*)¨ with an inclined surface. The exterior part of the cemetery should have a tree-lined walk made up of six to ten streets of trees that surround the area. The commission specified that the trees should be planted thirty feet away from each other to produce a lush vegetation and in time would develop corpulence. Furthermore, it emphasized that the prohibition of construction of any kind within an area of six hundred meters should be strictly observed and implemented.[72]

Inarguably, the recommendations provided by the commission composed of the city councilors and medical doctors reflected the ideas of modernity and ornate in the nineteenth-century cemetery and burial reforms. The proposal put premium to the public health and sanitary requirements of the capital and integrated the emerging and modernizing ideas with regard death and burial practices.

On 7 November 1864, the municipal architect of Manila, Félix Rojas, participated in the mortuary debate when he evaluated the recommendations forwarded by the Carranceja et. al. commission. The architect suggested that it was necessary to consider the changing burial methods in European cities, specifically London and Paris, as well as in other colonies such as India, in order to institute the most hygienic burial system for the colon. Rojas favored the employment of the ¨*panteón*¨ system over the *nicho* system. In the *panteón system,* the graveyard would be partitioned to private spaces for burial instead of building walls with loculi where cadavers were interred one loculus from the other. For him, this would eliminate the fear of fetid excretions and airs that were typical in the niches of the Paco cemetery. It was believed that the materials that were traditionally used in the construction of loculus were not ideal in preserving the salubrity of the cemetery. In Manila, the porous tuff used in cemetery construction did not provide excellent amalgamation and cohesion. As a result, gases emanating from the putrefying human remains were believed to escape easily and infect the air. In effect, the noxious gases and liquid that the cadaver excrete remained in the niches every time a loculus is opened for another cadaver thereby conserving indefinitely in its walls the odor of decay and death. In times of high mortality rate, this method contributed greatly to the outbreak of ¨miasmatic diseases¨.

[72] AHN, Ultramar, 501, Exp. 3, Informe de la Comisión, 30 agosto de 1864.

Rojas also added that the *panteón* system of of inhumation was better because it normally lead to the ornamentation of the graveyard as families build mausoleums, erect fences, and plant trees and shrubs around the *panteón,* which the architect considered as a welcome change from the monotonous appearance of the niches.[73] In Spain, the new typology of ¨*panteón*¨ that appeared in the first third of the century signaled a new period in the practice of burial. This gave way to the ¨individualization¨ of burial and established an eternal dwelling place for the members of a family. Naturally, this resulted to an increase on the prices of burial. Wealthy families had more access to this privileging of space. Meanwhile, the graveyard practice remained to be the typical custom for the lesser economic class.[74] These were the exact reasons why Estanislao Vives, then governor of Manila, disapproved Rojas´ suggestion on 11 November 1864. He added that the proposal was not suitable to the economic conditions and burial customs of the colony as ¨ interment practices in this country [Philippines] are very diverse from those of France and England¨ (*la costumbre general del país respecto a enterramientos son muy diversas de las que se siguen en Francia e Inglaterra*¨). [75]

The nineteenth century witnessed this process of the ¨parceling of cemeteries¨. With the increasing demand of the upper-class families to have their own ¨private spaces¨ in the cemetery, Rojas suggested that families may opt to improve the ornamentation of their ¨lots¨ through the planting of trees, putting up of fences, and the construction of mausoleums but these should be shouldered by their own expense.[76]

The stench of Summer 1865 and the government´s temporary solution

Despite all the proposals and debates that were produced in 1864, the concrete realization of a new cemetery for the capital seemed to have died down not until the cemetery crisis resurfaced in 1865. Several weeks before the peak of the dry season, Marcelo Ramírez, city councilor and inspector of the Paco general cemetery, pleaded for the city government´s urgent action with regard the corrupt odor that the cemetery had been emitting for several days in March 1865. The stench was completely intolerable during the afternoon and would continue

[73] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de F. Rojas, 7 de noviembre de 1864

[74] María-José Muñoz Mora, ¨Historia de dos ciudades: Análisis del urbanismo de los primeros camposantos españoles,¨ *P + C,* no. 7 (2016), p. 105.

[75] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Carta de Estanislao Vives, Corregidor de Manila, 11 de noviembre de 1864.

[76] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de F. Rojas, 7 noviembre de 1864.

the following day. According to Ramírez, the numerous cadavers that had been admitted in the Paco cemetery since 1863 disabled the proper management of the burial grounds. He appealed for the government´s swift response citing that it would be too late to arrest the situation once the period of strong heat during the summer months of April and May is felt.[77] As a response to Ramírez´ plea, Manila governor Vives ordered the reassigning of parish cemeteries in the capital, specifically Tondo, Santa Cruz, Sampaloc, and Malate cemeteries, to absorb the cadavers from the other suburbs. Tondo cemetery would have to accommodate cadavers from Binondo. Santa Cruz was ordered to take in dead bodies from the suburb of Quiapo. Sampaloc cemetery was asked to receive corpses from Quiapo and San Miguel while the mortal remains of Ermita would be conducted to the Malate cemetery. In effect, only cadavers from Intramuros and Paco will be buried in the Paco general cemetery hoping that this would relieve the crowding of more cadavers and minimize the emission of pestilent miasmas in the vicinity.

The three parish priests of Tondo, Santa Cruz, and Sampaloc did not provide a unanimous and unquestioned support for the city government´s proposal. The reaction and reply of the parish priests varied from outright submission to rejection. As mentioned, the local cemeteries of Tondo, Santa Cruz, and Sampaloc were used as provisional cemeteries. Of the three, Tondo parish priest Fr. Gregorio Prieto expressed his disagreement to the idea citing the following reasons: Tondo´s cemetery was already overly congested and could not even accommodate the deceased bodies that were being brought from nearby areas. According to Fr. Prieto, the almost incalculable deaths starting in October 1863 resulted to the rapid overcrowding of the burial ground. He added that corpses from the nearby district of San Nicolás, which was then part of the parish of Binondo, as well as dead bodies from other contiguous territories were already being sent to the Tondo cemetery. Given this situation, the priest ended his letter of reply by warning Vives that if the city will pursue its plan, Tondo will suffer the same fate as Paco´s in no more than three weeks.[78] Meanwhile, a more tentative tone was shown by Fr. Agustin de Mendoza, parish priest of Santa Cruz in his reply letter to the city government´s request. He said that Santa Cruz may accept cadavers from Quiapo if it were only for a ¨limited time¨. Finally, non-resistance and complete compliance was demonstrated by the

[77] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Marcelo Ramírez, 4 marzo de 1865

[78] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Carta de Gregorio Prieto, cura de Tondo, 7 de marzo de 1865.

parish priest of Sampaloc. Fr. Juanito Antonio Llerena openly accepted the idea and this was immediately welcomed by the parish priest of San Miguel, José Marie del Val.[79]

Undoubtedly, these responses which aimed to reduce the number of cadavers to be interred in the general cemetery of Paco were improvised and temporary solutions and only countered the short-term cemetery problems and challenges of Manila. Furthermore, these solutions contradicted the core spirit of the earlier decrees on cemetery and burial reforms as it reopened and reintensified the inhumations in the parish graveyards of the arrabales. It should be emphasized that most of these burial grounds were located inside or beside the church complex or in the midst of the populous settlements of the suburbs. Unfortunately, the provisional measures somehow killed or obscured the most important step in presenting a concrete and lasting answer to the exacerbating cemetery crisis of the capital - the construction of a new cemetery for the growing capital.

In October 1865, apart from a summary report made by Zoilo Ibáñez de Aldecoa reiterating the recommendations of the previous studies that (1) the best site was the one in San Lázaro hill (2) four rows of nichos would be constructed instead of six (3) small portions of land be sold in the interior part of the new cemetery to private individuals interested of constructing *panteones* similar to the practice being observed in big cemeteries in Europe (4) all revenue from Paco cemetery would be channelled to the construction of the new cemetery until its completion, nothing more was done towards the concretization of the said project.[80]

The second, third, and fourth commissions

It seemed that the provisional cemeteries bought time for the municipal government since it took more than a year and a half before colonial authorities acted again on the cemetery crisis of the city. Epidemic-related deaths also subsided which provided respite to Paco cemetery and the small parish cemeteries in the different suburbs. In 1867, the municipal government was seemingly set in acquiring and setting land demarcation in *la loma* de San Lázaro. On 14 January 1867, a second commission led by city councilors José Bonifacio Rojas and José Soler were appointed by then Manila governor Pablo Ortiga y Rey to undertake the task. However, Bonifacio and Soler changed the course of the plan when they recommended

[79] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Cartas de Agustin de Mendoza y Juanito Antonio Llerena, 7 de marzo de 1865.
[80] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Cartas de Agustin de Mendoza y Juanito Antonio Llerena, 7 de marzo de 1865. Informe de Zoilo Ibáñez de Aldecoa, octubre de 1865.

the search for a new site of the proposed public works project citing the problems of land acquisition and the location´s extreme isolation. According to Rojas and Soler, the city government would have to allot big funds to establish the necessary roads to make the site accessible to the population and it would be difficult to expropriate the lands involved since the real owners of the property could not be identified. With all these considered, the commission identified a piece of land to the north of the Hospital de San Lázaro as the site of the proposed new cemetery.[81]

The municipal architect Juan Caballero, described the proposed site as a rectangular piece of land of 36,100 *barras cuadradas.* The proposition also included the appropriation of an equal size of terrain beside the projected area for Chinese burial. According to Caballero, the acquisition of these lands alone was projected at 4,490 escudos with the lands for cemetery at 3,610 escudos and the construction of roads from Dulumbayan to Tutuban at 880 escudos.[82] However, aside from providing an estimate of the costs for land acquisition, Caballero and the authorities´ involved failed to come up with more concrete plans and details with regard the endeavor. One again, the project was shelved and lost urgency.

Almost a year and a half again had passed but nothing concrete came out of the second commission. On 14 March 1869, city councilors José Felipe Del Pan and Antonio Franco were appointed by Manila governor Manuel Azcárraga to replace the old commission of 1867. Perhaps this third commission was the most futile of all that were established since nothing had been produced out of this venture.

On 28 January 1870, a fourth commission composed by *alcalde de primera elección* Antonio Franco and councilor Mariano Martí was again created to tackle the new cemetery project. Compared to the second and third commission, Franco and Marti with municipal architect Baldomero Botella produced additional studies for the finalization of the planning of the graveyard venture.[83] On 9 November 1870, Botella reported to the higher officials of the land surveys that the commission undertook for the previous months in order to ¨choose well the terrain that would offer the best salubrity conditions for the capital´s new cemetery.¨[84]

[81] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Rojas y Soler, 7 de septiembre de 1868.
[82] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Juan Caballero, 7 de septiembre de 1868.
[83] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Antonio Franco y Mariano Marti, 28 enero de 1870.
[84] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Baldomero Botella, 9 de noviembre de 1870.

The report was quick to argue that ¨the previously chosen parcel of land to the north of the San Lázaro Hospital is extremely low and flows through it a part of the fluvial waters that form the estero on the west side of the Hospital ¨(*es sumamente bajo y por el atraviesan parte de las aguas fluviales que forman el estero lindante con el lado situado del oeste del citado hospital*).[85] To prove this point, Botella accompanied in his report an unsigned plan by former Manila architect Luciano Oliver which demonstrated the very proximity of the old proposed site to the bodies of water and the *pesquería* in the area (Seen Figure 5).

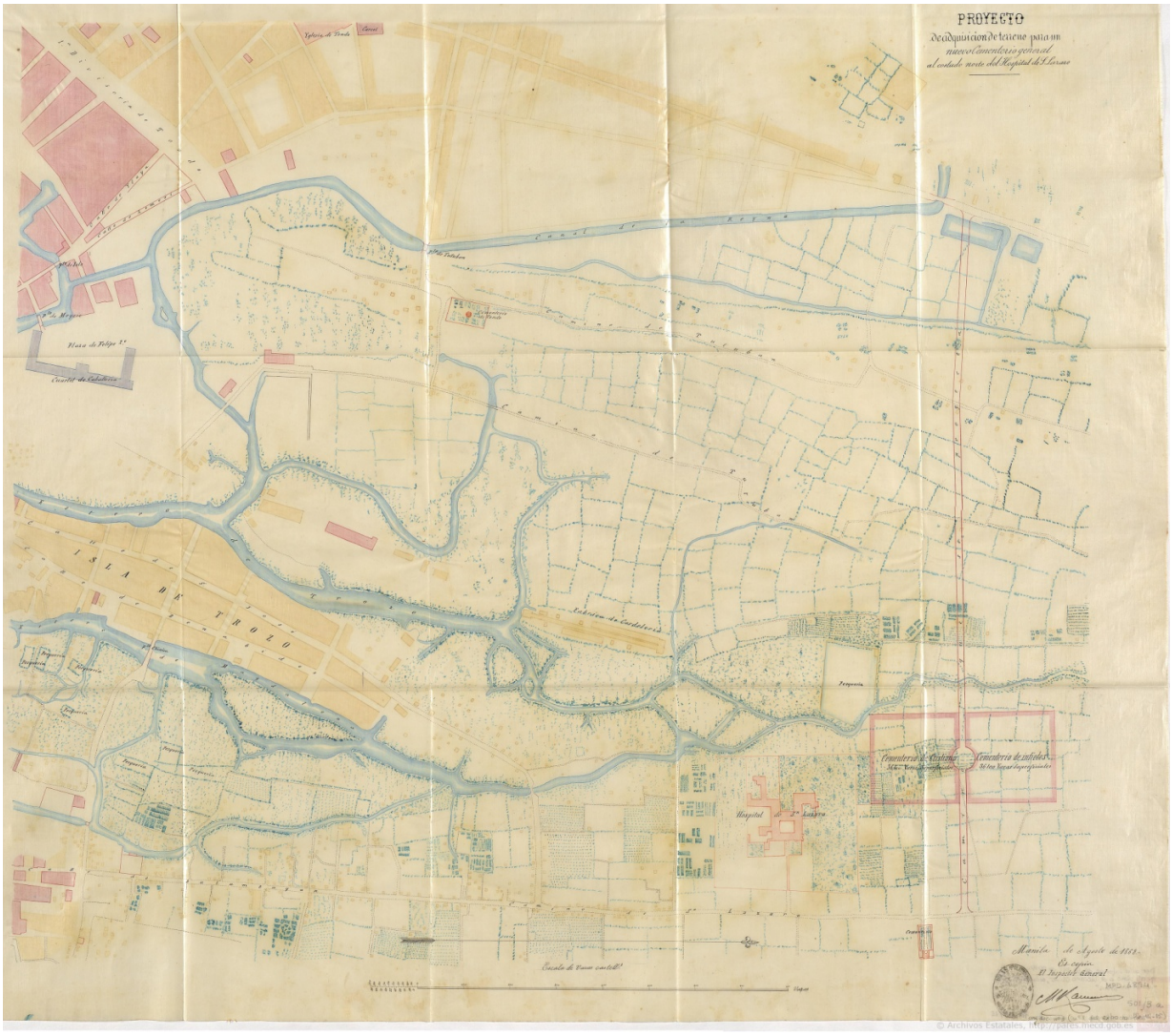


Figure 5. Plan showing the proposed lands to the north of the San Lázaro Hospital to be acquired for the construction of a new cemetery, 1868. (This plan was accompanied by a cemetery design (AHN, Utramar, MPD. 4895. See Appendix Chapter 3, C.)
Source: AHN, Ultramar, MPD.[86]

[85] Ibid.
[86] AHN, Utramar, MPD. 4894, Proyecto de adquisición de terreno para un nuevo Cementerio general al costado norte del Hospital de S. Lázaro por Luciano Oliver. agosto, 1868. The plan was an unsigned blueprint authored by Luciano Oliver.

Architect Botella added that:

> the muddy characteristic of this terrain is a cause of insalubrity for the proposed cemetery. For this reason, the area would be converted into a big pit where harmful [matters] would be formed and emitted which would taint and infect the air and alter the hygienic conditions of the vicinity of the San Lázaro hospital[87]
>
> *La formación fangosa de este terreno es una causa de insalubridad para el establecimiento que se intente de construir. Por este motivo se convertiría en un foso donde se formarían y desprenderían unos males deletéreos que viciarían e infeccionaran el aire y alterarían notablemente las buenas condiciones higiénicas que reúne en la actualidad el citado Hospital de San Lázaro.*

Given these conditions, the fourth commission identified an alternative 59, 974 square meter-site which supposedly met the requisites of a good location for a cemetery; a slightly sloped elevated land with good quality terrain, well-ventilated according to the prevailing winds, and conveniently far from the population. The proposed site which was estimated at 10,795 pesetas was marked ¨*Terreno elegido A*¨ in a plan authored by architect Baldomero Botella as seen below in Figure 6.

[87] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Carta de Baldomero Botella, Dirección de obras del ayuntamiento al Corregidor. 9 noviembre de 1870.

Figure 6. Plan showing the proposed new cemetery location belonging to the San Lázaro Hospital and the roads leading to the city and the arrabales, 1870.
Source: AHN, Ultramar, MPD.[88]

[88] AHN, Ultramar, MPD. 4896, Proyecto de situación del Cementerio que se proyecta construir en terreno perteneciente al Hospital de San Lázaro y de las vías de comunicación con la ciudad y sus arrabales por Baldomero Botella, 9 noviembre de 1870.

The plan demonstrated that the new proposed site was indeed relatively far from the San Lázaro hospital and the esteros in the area and located at the *loma* or hill of San Lázaro. It also clearly showed the projected new lay out of streets in relation to the proposed cemetery as shown by the traced red lines. The principal throughfare to the cemetery was the Dulumbuyan road which directly led to the suburbs of Santa Cruz and Quiapo. From Dulumbayan, two confluent roads would be laid out to connect the cemetery to the other arrabals. San Lázaro Street would lead to Avenida de Tutuban linking the arrabales of Trozo and Tondo to the proposed necropolis. Also, San Lázaro Street would branch out to the streets of San José and Benavides that would provide passage for the residents of Binondo. Finally, a new street named Avenida de Sampaloc was also suggested to connect the said suburb to the cemetery. Aside from laying out new roads and widening the old ones, bridges would also have to be constructed to connect Trozo and Tutuban as well as the traversing the *estero* of Quiapo.[89]

After these four commissions, the matter was passed on to several other city councilors to spearhead the project´s materialization. Unfortunately, it took another decade before the plan was resuscitated.

C. The *La Loma* Cemetery: A Modern Plan in the Midst of a Crisis

Francisco de P. Rodoreda, Antonio Ulloa and the Finalization of the La Loma blueprint

The story of the inception and final construction of the La Loma Cemetery was a painful picture that, despite the many attempts and intentions to introduce reforms, some or most good projects were just hampered by the colonial bureaucratic inefficacy that haunted the Spanish colonial administration in the Philippines. Changes in colonial officials and in policies, variations in proposals, lack of financial resourse hindered its immediate realization. After almost two decades since it was proposed in 1864, the idea was again floated in 1881 by Francisco de P. Rodoreda, a city councilor and inspector of the general cemetery of Dilao.

Rodoreda, a member of the progressive *Real Sociedad Ecónomica de Amigos de País,*[90] was determined in realizing the cemetery project for the capital. He did not mince words when he criticized the previous administrations for the unacceptable delay of the project. Four

[89] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Carta de Baldomero Botella, Dirección de obras del ayuntamiento al Corregidor, 9 noviembre de 1870.
[90] Florentino Rodao García, ¨De Colonizadores a Residentes. Los españoles ante la transición imperial en Filipinas¨ in María Dolores Elizalde and Josep M. Delgado (eds.), *Filipinas, Un país entre dos imperios* (Barcelona: Ediciones Bellaterra, 2011,) p. 260.

commissions were created and three distinct sites were proposed but nothing was actually materialized from 1864 to 1881. These and more words of frustration summarized the 16 March 1881 report of Rodoreda. According to him:

> It has been 10 years, Your Excellency, but nothing at all has been done. Although it is true that during such a long period, Your Excellency has appointed 4 different commissions for the drafting of an historic project, unfortunately, none of them has fulfilled the order that was asked of them. It is highly reprehensible and incomprehensible the pernicious abandonment and the unjustifiable delay that this project has suffered, and today, the entire population´s health and public hygiene is now threatened.[91]
>
> ¨[S]*e han pasado diez años Vuestra Excelencia que nada en absoluto se ha hecho, pues que si bien es cierto que durante tan largo periodo Vuestra Excelencia ha nombrado cuatro comisiones distintas para la redacción del que ya podemos llamar histórico programa, también lo es por desgracia que ninguna de ellas ha cumplido con el encargo que se le hiciera. Es altamente censurable e incomprensible el pernicioso abandono y la demora tan poco justificada que ha sufrido este proyecto y hoy la salud e higiene pública están amenazadas*¨

In this remark, Rodoreda reminded the high authorities that since the fourth and last commission in 1870, the project had been seemingly abandoned. The city councilor who experienced firsthand the glaring unsanitary condition of the burial ground while performing his job as inspector of Paco cemetery provided a renewed sense of urgency among the colonial authorities. He argued that although he was able to introduce some reforms in the cemetery management of Paco such as ¨the establishment of rules on death registration, organization of the cemetery archive, inscription of names and surnames of the deceased in the niches, and constant monitoring of the cleanliness and ornate of burial grounds¨, these were futile and inadequate if one would closely examine the conditions of the necropolis. According to him, the unceasing growth of communities and houses surrounding the cemetery and the suburb presented a constant and permanent danger to the public health. This observation was already cited in the 1864 commission´s report but never was it more felt after almost two decades of continued population growth and urbanization in Manila. Rodoreda added that the countless typhoons and several strong earthquakes resulted to the niches´ dilapidation with their broken vaults and walls and that one could notice the foul and disgusting smell emanating from the niches even including those that were recently closed.[92]

[91] AHN, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Carta de Baldomero Botella, Dirección de obras del ayuntamiento al Corregidor. 9 noviembre de 1870, Informe de Francisco de P. Rodoreda, 16 de marzo 1881.

[92] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe del inspector del cementerio de Dilao, Don Francisco de P. Rodoreda, 19 de febrero de 1871.

Rodoreda´s zeal towards the materialization of the new cemetery project resulted to his persistence on the municipal government´s commitment to appropriate 137,151 pesos for the cemetery project. More than half of the budget for the cemetery would be channeled to the construction of niches, *panteones,* and tombs amounting to 75, 900 pesos; then 18, 160 pesos for the construction of the cemetery chapel, the building for the dissection, inspection, and storage of cadavers, and the housing for the priest and other cemetery personnel; the paving of streets and the formation of garden and tree-lines necessitated 8, 000 pesos; and finally the acquisition of the terrain and other lands amounted to 4, 450 pesos. Rodoreda in his letter to the Governor General reported that the hilly lands owned by the Franciscans were already available for purchase according to the Franciscan priest Fr. Félix Huertas. He added that given the observed material and societal advancement of Manila, the city government should aspire for a necropolis that would correspond to the importance of its population and not a poorly-fenced and ill-managed cemetery that lacks design, management, and supervision.[93]

A year after Rodoreda´s reports, municipal architect Antonio Ulloa submitted on 21 February 1882 the blueprint of the new cemetery on the hills of San Lázaro. The plan, as shown in Figure 7, covered an area of 104,509 sq.m. wherein 11,913 sq.m of which were to be transformed into gardens. Knowing the immediate appearance and hilly location of the site was not sufficient for the engineers of the IGOP and JCOP. Excavations and trial pits had to be made to determine the characteristics of the soil and subsoil of the area. They found out that the soil of the chosen location was composed of a clayish superficial layer of soil and an alluvial subsoil of sandy and shelly composition wherein water could be found at 2 meters and 30 centimeters. According to the engineers, even if the trial pits were made during the rainy season, the chosen terrain still presented a generally good foundation for the necropolis.[94]

[93] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Francisco de P. Rodoreda, 16 de marzo 1881.
[94] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Memoria del Proyecto del arquitecto por Antonio Ulloa, 21 de febrero 1882.

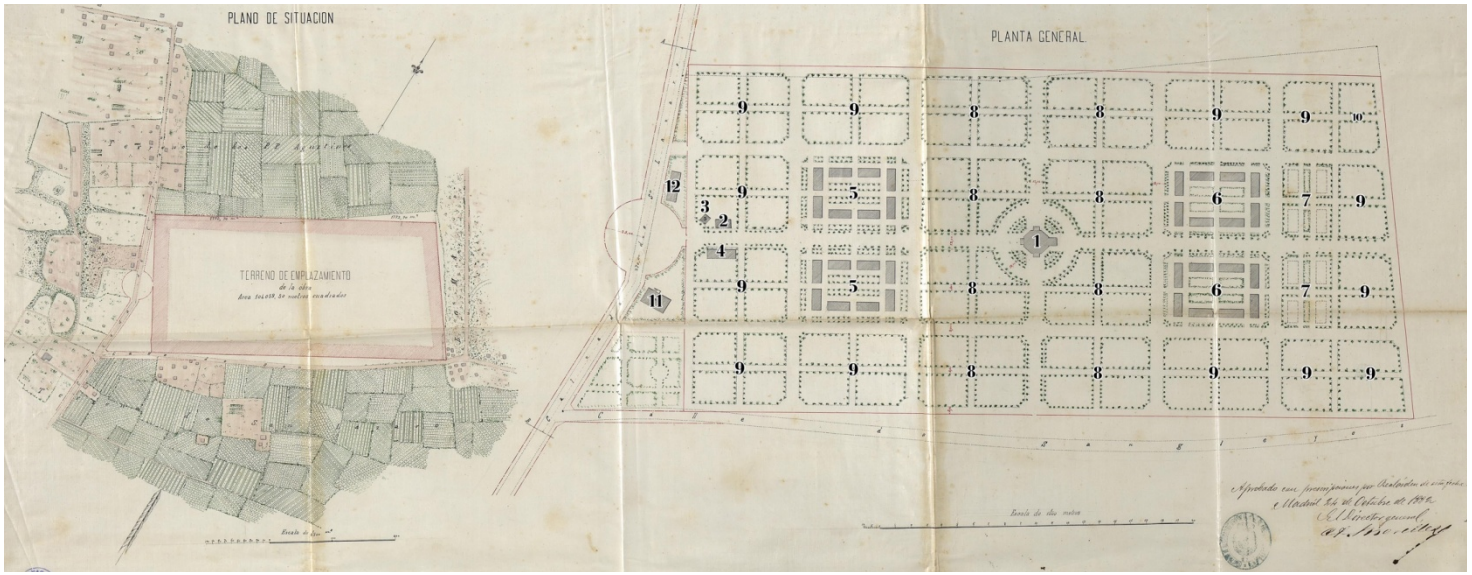


Figure 7. Plan for the construction of a new cemetery for Manila and its arrabales. Location of *La Loma general cemetery*, 1882
Source: AHN, Ultramar, MPD.[95]

Legend:
1- Chapel 2- Office
3- Concierge 4- Building for the dissection and inspection of cadavers 5- Niches for rent for one cadaver
6- Niches for sale that could contain one to four coffins: two adults and two children
7- Sepulchers for families that could contain up to six coffins
8- Land for sale for individuals and religious corporations for the construction of *panteones*
9- Land for the inhumation of deceased poor individuals coming from the municipal radius of Manila and the city´s civil and military hospitals
10- Land for individuals who died through execution 11- Residence for the cemetery priest 12- Residence for grave diggers and other cemetery personnel

[95] AHN, Ultramar, MPD. 4897, Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 1ª: "Plano de situación. Planta general" por Antonio Ulloa. 21 de febrero 1882.

¨Controlling the siting of burial grounds¨[96] involved the construction of fences and gates to establish the cemetery´s perimeter and enclose and enclose the sacred grounds for the dead. This technique signified that the lands could no longer be used for other purposes, for instance residential purposes, foraging site for animals, or other unregulated human activites. The design for the fence and principal gate is seen in Figure 8. Located in the center of the cemetery is the chapel in an octagonal shape as shown in Figure 9 and 10. The idea was best explained by Ulloa when he said that the ¨octagonal shape of the church located in the center was designed so that the temple, the place of preference for all good Christian shall dominate all points of the cemetery¨.[97]

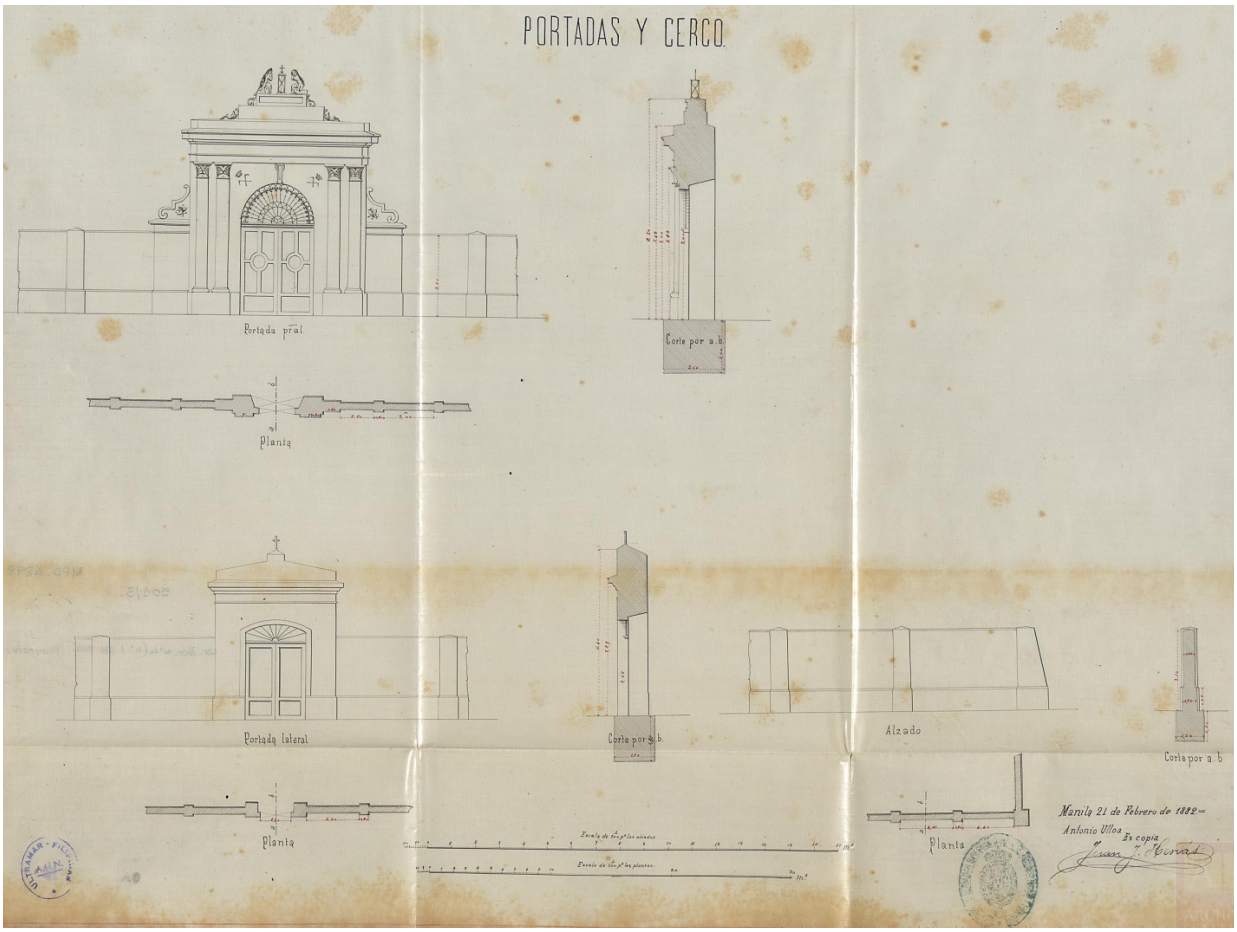


Figure 8. Plan for the construction of a new cemetery for Manila and its arrabales. Plan for the principal gate and fence, 1882.
Source: AHN, Ultramar, MPD.[98]

[96] Yeoh (2006), p. 289.
[97] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Memoria del Proyecto del arquitecto por Antonio Ulloa, 21 de febrero 1882.
[98] AHN, Ultramar, MPD. 4898, Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 2ª: "Portadas y cerco" de cerramiento por Antonio Ulloa, 21 de febrero 1882.

Figure 9. Plan for the construction of a new cemetery for Manila and its arrabales. Plan for the chapel and sacristy, 1882.
Source: AHN, Ultramar, MPD.[99]

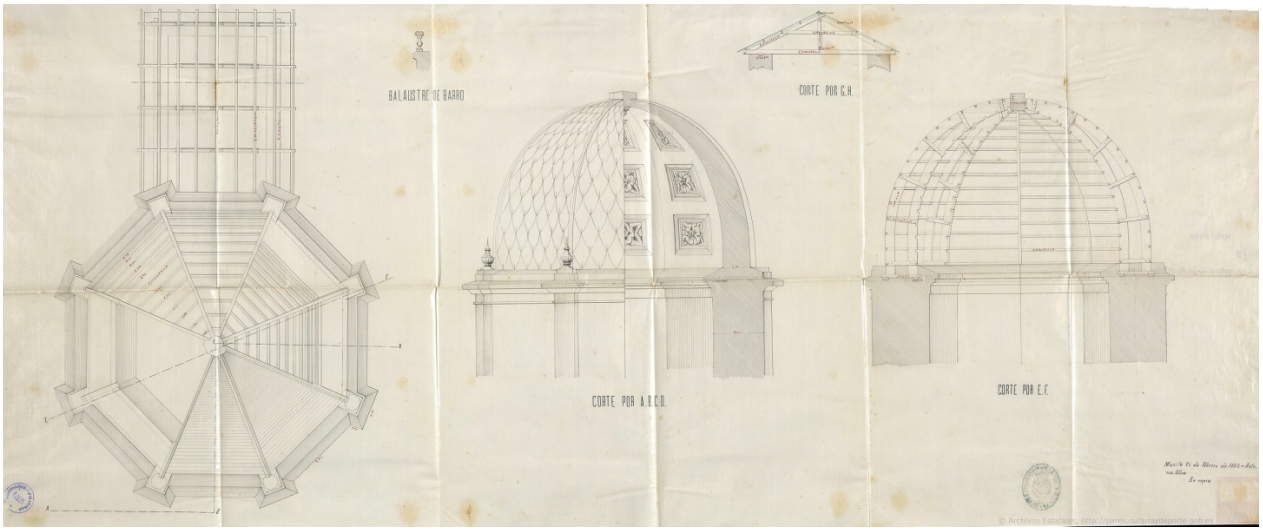


Figure 10. Plan for the construction of a new cemetery for Manila and its arrabales. Plan for the chapel and sacristy: roof, 1882.
Source: AHN, Ultramar, MPD.[100]

[99] AHN, Ultramar, MPD. 4899, Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 3ª: Capilla y sacristía: Alzado, cortes y detalles¨ por Antonio Ulloa. 21 de febrero de 1880.
[100] AHN, Ultramar, MPD. 4900, Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 3ª: Capilla y sacristía: Cubiertas.¨ por Antonio Ulloa. 21 de febrero de 1880.

Figure 11. Photos of the La Loma Cemetery principal gate, chapel, and burial niches. 1900-1902.
Source: J. Tewell Collections from the University of Michigan Special Collections[101]

As all other public works projects in the colony in the second half of the nineteenth century, the proposed new cemetery underwent review and examination by the Inspección General de Obras Públicas (IGOP) and the Junta Consultativa de Obra Públicas (JCOP) to ensure that construction standards were met. According to the engineers, the plan demonstrated a mix of the accepted burial styles in Europe and the Americas at that time and the traditional burial in niches that was widely-accepted and practiced by most natives.[102]

According to Muñoz-Mora, this mixed architectural style of cemeteries became widely incorporated in the Spanish peninsula in the mid-nineteenth century. La Loma cemetery in Manila was contemporaneous to the construction of one of Spain´s best example of this architectural style- the Nuestra Señora de la Almudena in Madrid which was constructed in 1884. This Romanticist architectural style in cemeteries resulted to the laying out of cemeteries that had diverse functions while incorporating the distinction between social classes: *panteones que realizan la prestancia que el difunto pudo tener en vida, las fosas se destinan a los menos pudientes y los bloques de nichos a las clases medias.*[103] In La Loma, these three burial types were present in its spatial design. Nineteenth-century cemeteries divided in plots reflected the growing middle-class demand and display for private property of death.[104] Burial vaults and ground spaces were not the only ones for sale or for rent. Eventually, inscription slabs or *lápidas* were also opened for the public to buy or lease such as the public bidding that was done on 16

[101] Accessed through the John Tewell Collections online page. Notice the abandonment of the interior part of the cemetery. The site was used as fort by Filipino revolutionaries during the turn of the century and was said to have been shelled by the American navy admiral Geordе Dewey.
[102] AHN, Ultramar, 501, Exp. 3, Informe de la Junta Consultativa de Obras Públicas, 14 de junio de 1882.
[103] Muñoz-Mora (2016), p. 105.
[104] Sarah Tarlow, ¨Landscapes of memory: the nineteenth century garden cemetery,¨ *European Journal of Archaeology* (2000), pp. 217-239.

September 1884. [105] According to Tarlow, the process of inscribing, naming, and marking the graves with durable materials did not only serve for identification but also a means of proclaiming ownership of a sacred place for the dead.[106]

Although garden cemeteries were generally regarded as British and American landscape styles[107], the plan that was submitted by Antonio Ulloa had strong elements of this necropolis design because most of the land in the La Loma plan went to the establishment of garden-style ground burial for the remains of the city´s deceased. The lands labelled ¨8¨ and ¨9¨ in the plan were designed for this type of burial. A considerable extension of land was dedicated for the construction of *panteones* that were located in between gardens. These plots that were labelled ¨8¨ were lands for sale for individuals and religious corporations that would wish to erect *panteones* and their own *mausoleums.* Meanwhile, the lands labelled ¨9¨ located in the peripheral areas of the cemetery were allotted for the inhumation in pits of the poor residents coming from the municipal radius of Manila and the military and civil hospitals in the city.

The architect, engineers, and city officials were unanimous in stating that despite the widely-accepted belief that burial in niches was less sanitary, eliminating this established custom in the colony was difficult given the state of the native population, their resources and culture. La Loma´s design included around 945 niches. The areas dedicated for construction of these loculus were labelled ¨5¨ and ¨6¨ and ¨7¨. The areas marked ¨5¨ constituted eight groups of 72 niches totaling 576, each one accommodating one cadaver, were opened for rent. Meanwhile, nine groups of 32 niches or a total of 250 were for sale, each one accommodating up to four coffins (two adults and two children) were referred to as ¨6¨ in the plan. Lastly, the smaller areas marked ¨7¨ were intended for intended to be sold to families with resources for the erection of 120 sepulchers that could fit 6 coffins. The design for these niches and vaults that were for rent, for sale, and catacombs for families were presented by Ulloa below in Figure 12. Lastly, a small parcel of land marked ¨10¨ in the blueprint was intended as common graveyard for individuals who died through execution.[108]

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[105] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 7446, Expediente sobre autorización al Corregimiento para celebrar un concierto para la venta de las lápidas en el cementerio de Dilao.
[106] Tarlow (2000), p. 230.
[107] Ibid., p. 218.; Richard Francaviglia, ¨The Cemetery as an Evolving Cultural Landscape,¨ *Annals of the Association of American Geographers,* vol. 61, no. 3 (Sep. 1971) p. 507.
[108] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Informe de Francisco de P. Rodoreda, 16 de marzo de 1881.

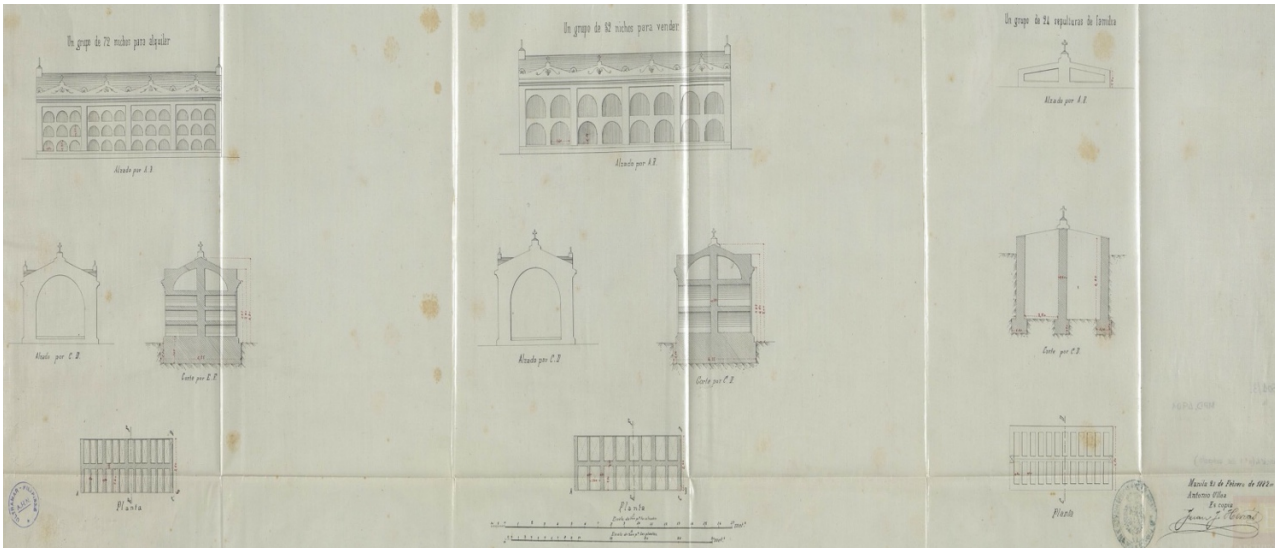


Figure 12. Plan for the construction of a new cemetery for Manila and its arrabales. Plan for the niches and sepulchres of families, 1882.
Source: AHN, Ultramar, MPD[109]

According to the IGOP and JCOP, a good projection on the future number of burials had to be done so that La Loma cemetery would not be easily overcrowded.[110] The data provided by the city authorities showed that that the years before the peak of the cholera outbreak in 1882, the annual average number of bodies buried in the capital was between 4,000 to 5,000 as shown in Table 3.

Name of Cemetery	**Year 1877**	**Year 1878**	**Year 1879**	**Year 1880**	**Year 1881**	**Total per cemetery**
General Cementery of Paco (Dilao)	2250	1634	1788	2215	2124	10,011
Tondo Cemetery	1361	875	1123	1496	1357	6,212
Sta Cruz Cemetery	737	676	950	960	699	4,022
Sampaloc Cemetery	587	417	509	749	571	2,833
Total per year	4935	3602	4370	5420	4751	23,078

Table 3. Recorded number of burials in Manila´s cemeteries from 1877 to 1811 provided by the municipal council of Manila.
Source: AHN, Ultramar, 501, Exp.3[111]

[109] AHN, Ultramar, MPD. 4901, Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 4ª: Nichos y sepulturas de familia por Antonio Ulloa, 21 de febrero de 1880.
[110] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Carta de Manuel Ramírez Bazán al Ayuntamiento de Manila, 17 de junio de 1882.
[111] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Estado numérico de los cadáveres que han sido enterrados en los cementerios del Distrito de Municipal durante el

The plan provided specific details on the improvement of the cemetery´s sanitation, physical ornate and order. The several areas of the cemetery were evenly organized to 24 blocks with each block designed for the different services of the necropolis. The streets inside the burial grounds were envisioned to replicate the sanitary and orderly thoroughfares of the capital and its arrabales. The principal streets were spaced out with 12 meters, 8 meter-distance for the secondary streets and 4 meters for the minor ones. *Chaflanes* or beveled angles were constructed in the corners of the streets to form small circular plazas. For purposes of sanitation and hygiene, the engineers recommended that the streets should be properly cleared, cleaned, and paved. These involved the elevation of well-flattened 25 centimer-thick soil, then adding another layer of thick rubbles from the San Francisco del Monte quarry which should be perfectly flattened to make it firm and resistant, and a final layer of clay concrete. They added that the creation of gardens was imperative for they do not only better the appearance of the site but also provide undulations to the terrain that facilitate drainage.[112]

The materials to be used for these constructions were also a mix of local and imported resources. The cemetery blueprint gave special attention to the types of materials that should be used. Stones and other materials for masonry work coming from the quarries in Guadalupe (San Pedro de Macati), San Francisco del Monte, and Meycauayan (Bulacan) should be free from crustations and charred parts and holes that weaken the solidity and resistance of the material. Ulloa and the engineers of IGOP commented that the niches for sale should utilize masonry from Meycauayan or San Francisco del Monte in Diliman and those for rent should make use of the ones from Guadalupe due to the former´s better qualities. This was reason why the constructions costs for each niche for sale was at around 98.77 pesos compared to 46.43 for each niche for rent. Naturally, the higher manufacture costs meant higher fees for the people. Also, the sand that would come from the Pasig river should be clean, free of strange matter, and not impregnated with salt water. The chemistry of construction materials was specified. For best results, the mortar that should be applied should be made by combining one part of stone lime to two parts sand. Different kinds of treated local wood were to be employed for different woodworks: *molave, ipil,* and *baticulin* for the important parts of cemetery structures and *ipil, dungon, yakal and banaba* for the flooring and other furniture. According to the techno-scientific experts, it was crucial that all wood was to be treated with tar and be cleared from

último quinquenio con expresión de lo que a cada año corresponde y cementerio de que proceda a saber, 8 de abril de 1882.

[112] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Memoria del Proyecto del arquitecto por Antonio Ulloa, 21 de febrero 1882.

sapwood, knots, and cracks. Meanwhile, iron, galvanized iron, and Portland cement were imported for the cemetery fence and principal gate, chapel, and other edifices. Also, marble for tiles were to be sourced out from Belgium and Italy as well as those locally-produced in Romblon.[113]

The construction of the different edifices and structures of the cemetery involved the employment of many laborers from the specialized handwork to ordinary helpers. Aside from the plans for the cemetery fence and gate and chapel, the residences and dissection hall for cadavers were also designed by Ulloa. (See Appendix Chapter 3**,** C for the rest of the blueprints.) Like in all other public works projects, the natives and the Chinese provided the bulk of this manpower. The following table presents the ordinary wage of the workers in the La Loma cemetery construction.

Laborer	**Minimum Wage**
Master painter (maestro pintor)	2 pesos
Master carpenter (maestro carpintero)	1 peso
Sculptor (escultor)	1 peso
Woodworker (ebanista)	1 peso
Foreman (capatáz)	75 cents
Painter (*pintor de pino*)	75 cents
Herrero (blacksmith)	75 cents
Hojalatero (tinsmith)	75 cents
Stonecutter (picapedrero)	75 cents
Builder (albañil)	75 cents
Quarry worker (cantero /carpintero distinguido)	75 cents
Quarry worker/ ordinary carpenter (canter/ carpintero ordinario)	50 cents
Wall painter (pintor de muros)	50 cents
One who applies varnish (*barnizador)*	50 cents
Ordinary worker (peon ordinario)	31 cents
Errand boy (muchacho)	20 cents
Table 4. List of labourers and their salary for the La Loma cemetery project *Source:* AHN, Ultramar, 501, Exp. 3[114]	

Apart from constructing the chapel and residence for the cemetery personnel, one interesting aspect of the La Loma design was the incorporation of a hall that would serve as a

[113] Ibid.
[114] AHN, Ultramar, 501, Exp. 3, Aprobación del proyecto de construcción de un nuevo cementerio en Manila, Memoria del Proyecto del arquitecto por Antonio Ulloa, 21 de febrero 1882.

morgue where cadavers will be deposited, a room for dissecting corpses and conducting autopsies, and a meeting place for the medical doctors. Inarguably, these innovations reflected the changing views towards the scientification and medicalization of death and nineteenth-century burial practices which showed the society´s ¨growing preoccupation with bodies¨[115]. City councilor and cemetery inspector Rodoreda was one of the champions of establishing scientific inspections of the dead.

What does it mean to be dead? Forensic autopsies and exhumation of the dead

The advancement of the field of legal medicine and forensic science was central in the development of modern cemeteries in the colony. According to, the employment of these fields in the nineteenth century through the ¨determining of wounds and burns, toxicology, etc¨ formed part of the ¨government´s strategies and defensive mechanisms against the threatened disorder especially in urbanizing cities and towns¨.[116] Perhaps, La Loma cemetery was the first cemetery in the Philippine colony that incorporated infrastructures for the scientific analysis of the dead. This also came in a time when ideas about the meaning and indicators of death emerged in the colony which resulted in the creation of a sanitary service for the inspection and review of cadavers.

Towards the late nineteenth century, several legal cases necessitated the exhumation of cadavers in cemeteries for further study. For instance, on 18 November 1880, the court of first instance ordered the exhumation of a cadaver in Malate cemetery. The order stated that the exhumation was necessary for the legal process and trial of criminal case no. 4587, a lawsuit believed to one of murder. The judge argued that the exhumation of the corpse for the justification or clarification of facts in criminal cases involving deaths is of urgent character in upholding justice. Because it was not under the court´s competency to undertake the task, the order necessitated the procurement of a permit which would allow the exhumation by select individuals and obtain the antiseptics, treatments and other indispensable materials for the task.[117]

[115] Tarlow (2000) p. 233.
[116] M.A. Crowther and Brenda M. White, ¨Medicine, Property and the Law in Britain 1800-1914.¨ *The Historical Journal,* vol. 31, no. 4 (Dec 1988), p. 856.
[117] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 7446, Expediente promovido por el Sr. Juez de Intramuros respecto de los medios y auxilios de que deberá valerse para proceder a la exhumación de un cadáver en los procedimientos criminales por muerte, 1880.

This case opened some bureaucratic and legal issues with regard death and exhumation in the colony. Recognizing that it was a serious public health issue and a matter that involved the religious and traditional sensibilities of the society, the colonial government through the Department of Health (*Negociado de Sanidad*) attempted to implement procedures for its standardization and scientification. These regulations involved the interaction of cemetery personnel as well as the medical-sanitary professionals. In order to standardize this process, the colonial government proclaimed the following decrees on how to undertake exhumations: First, only doctors (médicos titulares) should be the one to undertake the forensic activities. It should be ensured that they be properly compensated. If an accused has resources, the accused should be one to cover the expenses of the exhumation, including the doctor´s fee. If not, it would be the responsibility of the judge to cover all these costs; second, in the provinces and towns where doctors were unavailable, the gravediggers (*sepultureros*) should be the one to handle the exhumation procedures. The same compensation should be given them just like the medical doctors; and lastly, all materials, utensils, treatments, and disinfectants needed for the proper undertaking of the exhumation should be facilitated by the doctors of the Subdelegation of Medicine (*Subdelegación de Medicina*), chemists and pharmacists. Ideally, the services of the pharmacies closest to the cemetery where the cadaver will be exhumed should be preferred.[118]

Before this 1880 standard procedures on forensic activities were set by the Health authorities, there was already an earlier royal decree on 20 February 1863 that extended the peninsular laws on exhumation to the Ultramar. This decree, however, only involved the exhumation of burials that were already buried for a long time for purposes of removal or transfer of remains. For instance, it was specified that only bodies that were interred for the past two years or more could be exhumed with the supervision of medical professionals.[119] This decree was silent on the regulations on how to proceed with the unearthing of cadavers that were only laid to rest for days. Such was the case when five cadavers that were interred for more than two weeks were ordered to be exhumed by the court in 1866. According to the report, the dead bodies were buried on 21 February 1866 while the local authorities´ request for exhumation and the purchase of twelve bottles of chlorine *(cloro)* was made on 3 March. [120] However, this case clearly demonstrated the lack of uniform measures, proper regulations, and

[118] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 7446, Informe del Negociado de Sanidad, 17 de diciembre de 1880.
[119] AHN, Ultramar 5202, Exp.1, Aclaraciones de la Real Orden de 19 de marzo de 1848 sobre exhumación de cadáveres en la península y que se hizo extensivo a Ultramar por la Real orden de 10 de febrero de 1863.
[120] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 7446, Incidente relativo al pago de doce botellas de clorina invertidas en la exhumación y reconocimiento de cinco cadáveres ordenado por el Juzgado de Cavite a consecuencia de causa criminal.

assurance that trained medical experts performed the task. Eventually, precedents like this raised alarming concerns especially among the sanitary and urban reformers at that time.

The observance of the regulations promulgated by the health authorities in 1880 was put to the test when a contentious case of exhumation was ordered by a judge of the first instance and carried out by the *gobernadorcillo.* According to the sanitary authorities´ testimony, the exhumation was done ¨on a corpse that was in full rotting state without the participation of a doctor, the absence of proper scientific oversight and without taking any precaution according to what science dictates, and for these reasons the operation had been dangerous not only for those who carried out the digging of the grave and the inhabitants nearby the cemetery¨.[121]

The civil authorities required the priest and the *gobernadorcillo* to furnish reports of what transpired in the exhumation. According to the priest, on 25 May 1881 the *gobernadorcillo* ordered the exhumation of a cadaver as requested by the judge. The mortal remains of a woman believed to have died on 18 May from drowning were interred in the morning of 21 May 1881. So why was the exhumation requested by the judge? Although the document did not explicitly state, it may be because the official cited reason for the death of the said woman was drowning but the wounds found in her body may have had convinced the court of first instance to order its exhumation.

However, the cemetery guard reported that what they found was a cadaver that was already in intense process of decay which emitted a fetid smell. The stinking odor was intolerable that all those who were engaged in the operation had to cover their noses with handkerchiefs and that the smell spread even outside the cemetery premises. The authorities accused the *gobernadorcillo* that it was clear that they did not take the most rudimentary precautions to prevent the atmosphere from being infected with such an insufferable stench that went beyond long distances.

In his defense, the *gobernadorcillo* claimed that he just acted upon the orders of the court of the first instance. Supposedly, he attempted to ask the advice of the parish priest and the medical doctor but found them unavailable. The government thought that it was unwise and imprudent on the part of the judge to order the exhumation without considering the body´s decomposing state and the possible risks of an epidemic that would threaten the public health.

[121] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 7446, Incidente sobre una mujer ahogada, Informe de 6 de junio de 1890.

It was also stated that even if the medical doctor was available, the state of putrefaction of the body was already advanced that it was already highly impossible to ¨examine the wounds and conduct an autopsy of the cadaver¨.[122] As a consequence, the central government reminded the local authorities and all concerned of the previous decree with regard the responsibilities of the medical doctor and courts and the standard operating procedures on the proper conduct of the exhumation.

These occurrences came at the same time when Rodoreda began to challenge the long-practiced custom of identifying the dead and the lack of medical and scientific basis on ascertaining its cause. As cemetery inspector of the city, he lamented that most cadavers that were being interred in the graveyards of Paco and the parish cemeteries of Santa Cruz, Sampaloc, Tondo, and the Chinese cemetery lacked medical assistance thus making it impossible to know what kinds of diseases had led them to the grave. Perhaps influenced by the dominant discourse on ¨premature burials¨ that caught the interest of British, French, and European societies at that time,[123] he asked the question ¨Who can ensure that all these deaths were true? (*¿Quién es capaz de asegurar que todas estas difunciones han sido verdaderas?*)¨.[124] Raising the discourse to a more scientific level, he asked what were the accepted characteristics for a person to be considered dead. He added that there were four evident signs of death: putrefaction of the body, cessation of heart beat, corpse rigidity, and the lack of muscular contractions to galvanic excitation. The cemetery reformist added that of these four, the last three indicators could only be distinguished by experienced doctors. He said that only through the medical professionals' inspection and analysis and their training of the difficult science of healing, could death be truly established. He forewarned that many times, conditions due to attacks caused by apoplexy, epilepsy, asphyxia, catalepsy, ecstasy, hysteria, or syncope simulate the most perfect resemblance to death. It would not be surprising, he argued, if many were actually false deaths.[125]

Rodoreda´s reform ideas were not only limited to the secularization of the cemeteries but also towards secularizing the funerary culture and the concept of death itself. By bringing in modern ideas produced by medicine and science concerning the body and death, he challenged the burial reforms in the colony that were reminiscent of the practices of the ¨old

[122] Ibid.
[123] George K. Behlmer, ¨Victorian Medicine, Moral Panic, and the Signs of Death.¨ *Journal of British Studies,* vol. 42, no. 2 (April 2003), pp. 209-210.
[124] AHN, Ultramar, 5281, Exp. 4, Copia del expediente relativo a la organización de un servicio sanitario facultativo de reconocimiento de cadáveres.
[125] Ibid.

Europe¨. In the Philippines, it was common practice that ecclesiastical burials were made without other requirements except a verbal or written notice to the parish priest and a few circumstantial data about the deceased such as civil status.

For the cemetery inspector, it was the authorities´ civil and moral duty to introduce reforms to this old practice and the importance of properly identifying the cause of death; whether it was natural or violent, or instigated by illness and disease. With the absence of proper scrutiny, many burials were wrapped in the shadows of mystery. He cited that in Paco cemetery, most cadavers were covered with a shroud or a religious habit which completely obscured the deceased since only the face and hands were exposed. He warned that ¨Nothing is easier then, in this case, than the sad garment of the dead concealing the traces of a crime, hidden from the justice of men and therefore impossible to punish¨ (*Nada mas fácil pues, en este caso, que la triste vestidura de lo muerto encubra las huellas de un crimen, oculto para la justicia de los hombres y por tanto imposible de castigar*). Rodoreda also criticized the widespread practice of many Chinese of putting their dead in heavily nailed boxes which were almost impossible to inspect. Most of the times, it was just assumed that the bodies that were inside the tightly locked coffins carried typically by four Chinese men were deaths due to natural causes.[126]

Calling for reforms, Rodoreda called on the urgent creation of an inspection for cadavers to help the people, especially the natives and Chinese, ¨who through the help of medical science may be guided if death is to be true or to be only apparent¨. Likewise, this scrutiny would help authorities the emergence of illnesses and epidemics in the colony. The Subdelegation of Medicine and Pharmacy in the Philippines agreed due to the urgency of this measure due to the excessive rise of different catarrhal, inflammatory, gastric and lipoid diseases as well as malarial fevers and smallpox due to the worsening hygienic conditions of the capital.[127]

As a consequence, the sanitary service was created through a royal decree on 26 February 1884 that would perform the inspection of dead bodies coming from Intramuros and the arrabales and the town of Santa Ana as well as provide free medical assistance to the poor residents of the capital. This involved the appointment of sixteen doctors: one to be assigned in Intramuros; two for each arrabal of Binondo, Tondo, Santa Cruz, Sampaloc; and one for the districts of Quiapo, San Miguel, Ermita, Malate, San Fernando de Dilao/Paco, Santa Ana, and Trozo. [128] With regard death and inhumation, it was ordered that no cadaver would be interred

[126] Ibid.
[127] Ibid.
[128] AHN, Ultramar, 5281, Exp. 8, Expediente sobre asistencia médica farmacéutica gratuita a las clases proletarias de Manila, sus arrabales y pueblo de Santa Ana.

in the cemeteries in the capital and the arrabales without a corresponding certificate written and signed by the sanitary professional which indicate the person´s cause of death. These doctors were required to document in the death certificate the name, race, sex, age, reason of death and other details of the deceased that would be of further interest.[129]

The 1882 epidemic and the state of Manila´s graveyards

While it is undeniable that the La Loma cemetery plan projected almost all the elements of an ideal proposal, the circumstances of the early years of the 1880s, however, pushed for its utilization even before its final termination. Like the Paco cemetery, La Loma had to be opened as a provisional cemetery for the victims of the countless cholera epidemic of 1882.

Colonial authorities found it impossible to continue the use of Paco cemetery since it was undisputed that it had become a public health risk through time. The smaller parish or district cemeteries were also undependable due to their worsening conditions and very limited capacity. Manila´s colonial government became increasingly worried with reports that excessive numbers of cadavers were brought to Paco and the other cemeteries every day.

During the height of the 1882 epidemic, the urban residents of Manila became more expressive as they used public platforms to raise their fears and concerns involving sanitation and public hygiene. Paco cemetery was one of the considered public health threat at that time with the daily periodicals in Manila publishing several letters, petitions, and pleas on the poor location of the cemetery and its intolerable conditions. For instance, an unnamed subscriber of the periodical *El Comercio* expressed that the cemetery in the suburb, which was close to a river (or estero perhaps?) and a principal road, ¨did not possess the necessary conditions of salubrity and greatly inconvenienced the residents in the area¨. The clamor from the people was strong that it pushed for the action, albeit lacking in results, of the *Junta de Sanidad de Paco* to inspect the vicinity, propose various lands that would fit for a new cemetery that would be far from the houses in the said arrabal.[130]

On the other side of the river bank, Tondo´s two cemeteries at that time were also both sites of concern. The first one was located almost beside the shore of Manila bay in the barrio of Vitas while the other was located on the confluence of the Estero of Vitas and the Canal de

[129] *Reglamento para el servicio de asistencia de médico-farmacéutica gratuita a las clases proletarias de Manila, sus arrabales y pueblo de Santa Ana,* Manila: Imprenta Amigos del País, 1885.
[130] ¨Mal Sitio¨, *El Comercio,* año XII, número 1192, 1 de septiembre de 1882.

la Reina. Both graveyards were situated in low-lying lands that were too close to bodies of water. As such, these sites were inundated during wet seasons or at high tide, and, in effect remained waterlogged at all times. An anonymous resident wrote in behalf of the other residents of barrio Tutuban in Tondo and those residing near the Canal del Reina of the efforts of the gobernadorcillo of Tondo, Don Agustín Edon Santiago, to minimize the pestiferous emanations and noxious airs emanated by the cemetery near the confluence of the Estero of Vitas and the Canal de la Reina by covering the burial ground with lime and salt. [131]

The periodicals became spaces for *anonymous concerned* residents of the city to raise their concerns involving their habitat, urban environment, etc. These pleas heightened as the residents grappled with fear and distress as many people succumbed to the deadly epidemic. The concerns were directed to the colonial government, the local officials, as well as to fellow residents in the barrio. The periodical also offered an opportunity to follow up the concerns that were still unresolved. For instance, an open letter entitled *Nada se ha hecho* complained on the continuing inaction and lack of concrete improvement results on matters concerning sanitation and hygiene near the cemetery and road of Paco:

> *"I find myself in the need to bother you again about the lack of sanitation that the road of Paco offers, because despite the calls of this newspaper to fence and drain the lands of Don Pedro Gutiérrez Zalasar and the neighboring areas, nothing has been done and the stagnant and corrupted waters continue to infest the neighborhood and cause numerous victims among them the public cleaning cart drivers, who with their families live on the banks of the aforementioned swamp. I understand that our zealous authorities have ordered the embankment and fencing of the aforementioned plots, but nothing had been completed so far, and as it is a hygienic question of the first importance, not only today but always, I strongly urge you to, if you see fit, insist on your valuable newspaper so that this evil can be remedied.*[132]
>
> *Me veo en la necesidad de molestar a V. de nuevo sobre la falta de salubridad que ofrece esta calzada de Paco, pues a pesar de la excitación que se sirvió hacer en su periódico para que se terraplenase o desaguase el terreno de don Pedro Gutiérrez Zalasar y se cercara el contiguo del Sr. Pérez hijo, nada se ha hecho y continúan las aguas estancadas y corrompidas infestando el barrio y produciendo numerosas víctimas entre los carretoneros de la limpieza pública, que con sus familias viven sobre y a orillas del precitado pantano. Tengo entendido que nuestras celosas autoridades han ordenado el terraplén y cerco de los precitados solares, sin que hasta ahora se haya cumplimentado ni aun principiado a cumplimentar, y como es una cuestión higiénica de primera importancia, no solo hoy sino siempre, le ruego que si lo tiene a bien insista en su apreciable periódico para que se ponga remedio a este mal.*

[131] ¨¡Pestífero!¨, *El Comercio,* año XII, número 1192, 1 de septiembre de 1882.
[132] ¨Nada se ha hecho¨, *El Comercio,* año XII, número 1192, 1 de septiembre de 1882.

Bombarded with many reports on the pestilent sanitary conditions in the existing cemeteries of the capital, it was clear for the city council of Manila and the superior civil government that the only solution to confront the cemetery crisis was the opening, albeit provisionally, of the new general cemetery of La Loma.

D. Modernity, Death and Burial: Contestations and Responses

Contested narratives, Contested numbers

Newspaper accounts during the peak of the epidemic provide a rich narrative on the debates and controversies surrounding the cemetery and burial crisis. At this time, newspapers *El Comercio, La Oceanía Española, Diario de Manila,* and *Diariong Tagalog* dedicated many pages on the matter providing situationers and insights on the matter. The first two periodicals urged the necessity of improving the state of the cemeteries and burial practices while maintaining a cordial and amicable tone in its columns and commentaries. *Diario de Manila,* however, portrayed an image of a government that was efficient in the management of disease outbreaks and cemetery crisis. On 3 September 1882, it lauded the sanitary measures imposed by the authorities reporting the successful inspection of the governor general of the islands with regard the status of the hospitals, hospices, and cemeteries in the capital reporting the:

> [*c]leanliness that reigns in the hospitals, with the greatest concern for the health of the sick who are provided with all the means that science could provide to combat the disease… The hospices are perfectly organized [m]ost of them with good and abundant food and broths; The cemeteries are abundant with lime and with the deepest of pits for the burial of corpses, such that His Excellency did not notice even the slightest corrupt smell. His Excellency had also the occasion to observe that almost all corpses were brought to the cemeteries in properly enclosed carriages and caskets.*[133]
>
> *que en los Hospitales reina la mayor limpieza, la más grande solicitud y abnegación por la salud de los enfermos y están provistos de cuantos medios aconseja la ciencia para combatir la enfermedad. Las Casas de Socorro están perfectamente organizadas y surtidas de cuanto las circunstancias reclaman, pues que en la mayor parte de ellas hay caldos y alimentos buenos y abundantes. Los Cementerios con abundancia de cal y con fosas profundísimas para dar sepultura a los cadáveres, hasta el punto que no advirtió el más ligero mal olor. También tuvo ocasión de observar que casi la*

[133] ¨Crónica¨, *Diario de Manila*, número 201, 3 de septiembre de 1882.

totalidad de los cadáveres eran conducidos en carros convenientemente cerrados.

However, this image of perfectly organized and managed cemeteries, hospitals, and hospices were a complete opposite as per *Diariong Tagalog,* one of the newspapers that heavily published the cholera epidemic outbreak of 1882 and its effects on the state of hospitals and hospices and to the conditions of cemeteries and mortal remains disposal. Critical of the government´s sanitary policies and decisions, the newspaper exposed the authorities´ mismanagement of the crisis highlighting the adversities experienced by the city residents in the different arrabales of Manila. For instance, it disproved the reports that the situation in hospitals and hospices were still under control citing that even the Hospital of Santo Tomas could no longer accept sick individuals to be admitted in the said institution. The limited capacity of hospitals and hospices in Intramuros and the arrabales could not attend to the numerous individuals suffering from the contagious illness.

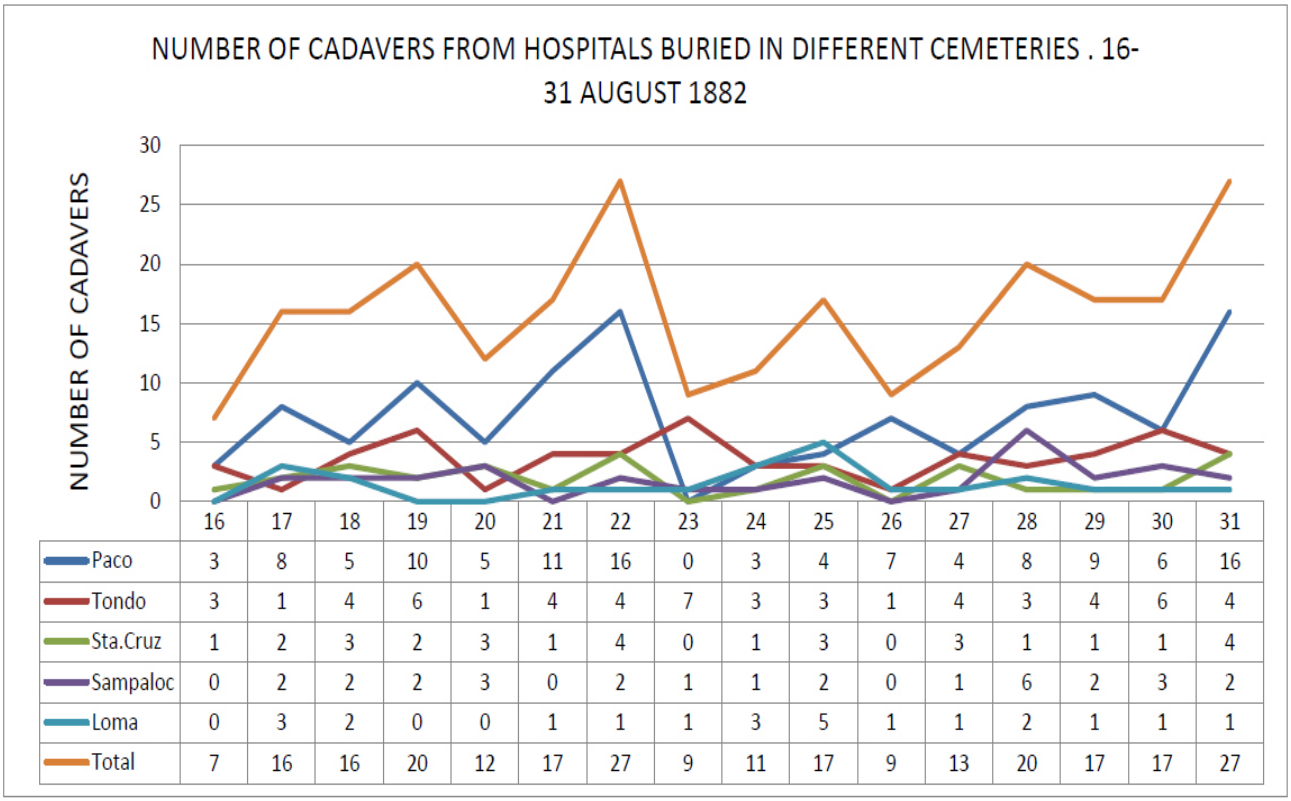
The newspaper also highlighted the miserable state of the small cemeteries in the arrabales contrary to what was reported by *Diario de Manila* on the same day of 3 September 1882. For example, it published the urgent plea of the *gobernadorcillo* of Tondo so that the cemetery of said arrabal be immediately covered with lime and salt.[134] This deplorable state of the capital and the impending risks to public health was also documented by the periodical *La Oceanía Española* highlighting the state of the hospitals in Tutuban (Tondo), Malate, and San Lázaro and the miserable status of cemeteries in the arrabales. According to the paper, the cemeteries ¨deserve closer scrutiny from the government, because not only are they feared to be a source of infection but are also believed to be originators of typhus epidemic during the dry season¨. Citing the ideas of French chemist Michel Eugéne Chevreul´s *Principes de l'assainissement des ville* (Principles of urban sanitation) that cities located on flat low terrain and on the banks of a rivers should construct cemeteries downstream so as not to infect the waters*, La Oceanía Española* alerted that this was quite an impossible condition to fulfil given Manila´s topographic circumstances. It therefore cautioned the authorities to properly spot the ideal location for Manila´s cemeteries to prevent further peril to public sanitation.[135]

Perhaps it could be argued that the 1882 epidemic and its effect to the cemetery crisis of the late nineteenth century was the first recorded case of contentions in mortality statistics. Actually, counting and tallying the dead was not new since this was already done in 1822 and 1864 as shown in the earlier discussion of this chapter. What was novel in 1882, however, was

[134] ¨Local¨, *Diariong Tagalog,* número 78, 3 de septiembre de 1882.
[135] ¨Los Cementerios¨, *La Oceanía Española*, número 201*,* 3 de septiembre de 1882.

the documented contentions and contestations among some members of the colonial society as to how the process of documenting the dead came to be. The official numbers of deaths published by the colonial government and what these casualties meant were disputed and contested.

The *Gaceta de Manila*, the Spanish government´s official newspaper first published a tally of cholera-related deaths on 16 August 1882. At first, only weekly reports were published in the official newspaper. The number of deaths from August 16 to 23 appeared in the August 29 issue while those that succumbed to the contagious disease from August 24 to 31 were tallied in the September 3 issue. Figure 13 shows the summation of burials in the different cemeteries of the capital according to the official count of the colonial government from 16 to 31 of August 1882. (The complete table is seen in Apendix). However, this official data was problematic because it was only focused on the data generated from the city´s hospitals (e.g. San Juan de Dios Hospital, Military hospital, small hospitals erected in the arrabales) thereby obscuring the deaths of the majority of Manila residents who were not able to access medical attention. Also, the highly-fluctuating tally of day-to-day deaths could also be subject to close scrutiny.



	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Paco	3	8	5	10	5	11	16	0	3	4	7	4	8	9	6	16
Tondo	3	1	4	6	1	4	4	7	3	3	1	4	3	4	6	4
Sta.Cruz	1	2	3	2	3	1	4	0	1	3	0	3	1	1	1	4
Sampaloc	0	2	2	2	3	0	2	1	1	2	0	1	6	2	3	2
Loma	0	3	2	0	0	1	1	1	3	5	1	1	2	1	1	1
Total	7	16	16	20	12	17	27	9	11	17	9	13	20	17	17	27

Figure 13. Number of cadavers from hospitals buried in different cemeteries. 16 to 31 August 1882.
Source: Costelo, 2020. Elaborated by using the data from *Gaceta de Manila*, 29 August 1882; 3 September 1882.

Diariong Tagalog, a newspaper known for propagating democratic liberal ideas, used this as a propaganda issue to criticize how the colony was being administered. An article in Diariong Tagalog on 2 September 1882 raised suspicions on the veracity of the weekly tally of epidemic-related deaths in Manila that was provided by the authorities.

> *Hangga ngayon ay ang parte sa bahay-bahay, at sa hospitales at ilang balita sa cementerio ang siyang magulong pinag cucunan ng gayong estado; ay hindi nga cataca taca ito, i, mga mali datapoua buhat ngayon ay ilalagda ang totoong bilang.*
>
> Hasta ahora los partes domiciliarios, con los suministrados por los hospitales y alguna que otra noticia de cementerios, servían de confusa base para la formación de aquellos; no es extraño, pues, que estuvieran sujetos a error; más a partir desde hoy serán, como hemos dicho anteriormente, cifras exactas.[136]

The men behind this periodical found the ¨lack of accuracy in the official reports of the havoc caused by the epidemic¨ denouncing the government´s concealment of the real effects of the epidemic as well as the updated and actual situation on the ground.[137] Naturally, less deaths meant better crisis management by the authorities. However, the numbers provided by the authorities seemed unbelievable for the newspaper citing that the mortality data indicated by the reports from the domiciliary visits (*partes domicilirios*), hospitals, and cemeteries only confused rather than provide clarity to the real extent of the crisis.[138] It urged the government to provide daily, direct, and accurate reports of all interments in cemeteries because these were ¨the only data that could shed light on the real truth of the matter.¨ It added that if the cemetery situation would be used as gauge, the discomforting conditions of the burial sites and the practices in these spaces would reveal the severity of the public health problem of the capital. Through a scathing commentary, it uncovered the real state of the collapsing cemeteries in the capital that had to endure the endless burial of people who succumbed to the widespread disease.

According to the newspaper, the government´s policy of hiding the truth so that fear would not spread among people was unacceptable. It proceeded by reminding the colonial authorities in the Philippines to revisit the Spanish colonial government´s handling and response during the 1865 epidemics that wreaked havoc in Spain. As an advisory board, the Medicine Academy of Madrid urged that truthfulness and transparency should be exercised in times of epidemic- a true disposition of wisdom and civility of people and the glory of Spain and science. This was tested when Barcelona conspired to hide the real situation of the epidemic

[136] ¨Como se pedía¨, *Diariong Tagalog,* número 77, 2 de septiembre de 1882.
[137] Ibid.
[138] Ibid.

outbreak for fear that the crisis would bring consequences to its manufacturing and commercial interests. It was reported that Barcelona spent days and days entertaining themselves with palliatives without declaring the real extent of damage that the outbreak has already caused. In the end, the real state of the city could not be ascertained as multitudes of differing and conflicting versions of truth emerged. As a subject of epigram, it was said that during the time the state of the city depended on whether the information was ¨official¨ or ¨unofficial¨ or whether it was the ¨captain´s or the soldier´s story¨.

The matter was also utilized by the liberal men, composed by the likes of Marcelo H. del Pilar, to forward the indispensability of free press and uncensored speech in the colony to uncover the truth. In relation to the cemetery and epidemic crisis, the newspaper addressed those in power:

> Where there is a press that sees, where there are chroniclers who write, where there are statesmen who take note, where there are people who live in certain neighborhoods: How can you ensure in an official document, for example, that only 70 people have perished in one day, if twice this number had been buried in a single cemetery in a single day? If the burials could be hidden, if the secret could be kept, then we would reserve our opinions at critical moments, leaving for later the publication of all the horrible things that the truth brings. But, how can it be hidden from the people, if 80 to 100 people who work in the cemeteries each have a family, if burial carts and stretchers [with cadavers] pass through streets and roads of about three quarters of a league continuously crowded with people, and if a big number of those who die are accompanied by their relatives and loved ones?... Horrible is the truth sometimes; but always a hundred times more horrible is doubt; and thousands of times ever more horrible is mistake. Say, therefore, the clear and simple truth and keep in mind that truthfulness as a virtue can only be harmful to those who are not well with their conscience. [139]
>
> *Saan man at may prensang nagmamasid, saan ma´t may cronistang nagtatala nang mga bagay na nangyayari, saan man at may mga estadista na nagtatanda nang bilang nang mga bagay-bagay, saan man at may mga mama-mayang nangag cacalapit-lapit ng pamamahay ¿paanong ma-ititic sa isang documento oficial, sa halimbuaa, na ualang namamatay, cun di pitong-puong catauo sa isang arao, cun sa isang Cementerio lamang ay nalilibing ang dalauang gayon? Cung maicucubli sana ang pag lilibing ay aayon cami sa ipag lihim ang totoo at saca na ihayag: Datapua paanong mai tatago sa gayong baua,t cementerio ay may ualongpuo o using daang catauong pauang may*

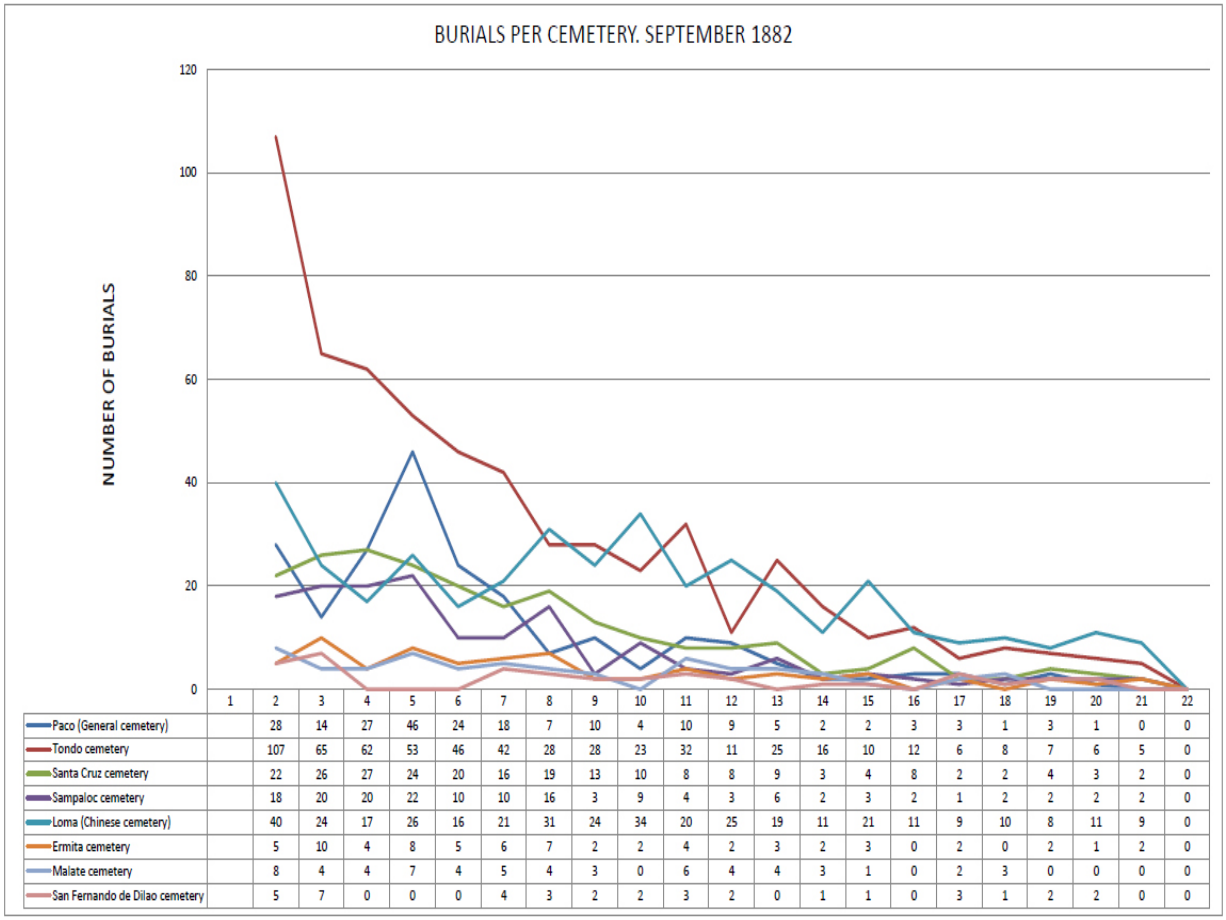
[139] ¨Dos Criterios¨, *Diariong Tagalog,* número 76, 1 de septiembre de 1882. *¨Donde hay prensa que ve, donde hay cronistas que anotan, donde hay estadistas que apuntan, donde hay pueblo que vive en determinadas vecindades: ¿cómo puede asegurarse en un documento oficial, por ejemplo, que solo han perecido setenta personas en un día, si en un solo cementerio se ha enterrado el doble? Si las inhumaciones pudieran esconderse, si el secreto pudiera guardarse, entonces opinaríamos por la reserva en los momentos críticos, dejando para más tarde la publicación de todo lo horrible de la verdad: pero, ¿cómo podrá esconderse esta al pueblo, si en un cementerio trabajan ochenta o cien personas que cada una tiene su familia y los carros y camillas han de pasar por una calle de cerca de tres cuartos de legua atestados continuamente de gentes, y si una buena parte de los que fallecen son acompañados por sus deudos y allegados?...*

familia ang nagtatrabajo at ang carro at camilla ay idinadaan sa mahabang lansangang puno ng tauo at maraming namamatay ang pinaquiquilibingan ng marami naman.

By 2 September 1882, the *Gaceta de Manila* started publishing daily tallies of cholera-related deaths. It is unsure if this alone was the triumph of the strong propaganda work of groups like Diariong Tagalog but their barrage of commentaries and critiques surely hit the colonial authorities. For almost three weeks in the months of September 1882, the official newspaper published day-to-day reports on the number of cadavers that were buried in the different cemeteries of the capital. From 2 September to 22 September, the authorities presented to the public its official version of the extent of the epidemic that hit the city as shown in the table below. Table 5 is a tabulated summary of the daily reports published in Gaceta de Manila for the abovementioned period. (The day-to-day count can be seen in the Appendix for this chapter). Colonial authorities documented the number of cadavers interred in Paco general cemetery, the Loma Chinese cemetery, and the parish cemeteries of Tondo, Santa Cruz, Sampaloc, Ermita, Malate, and San Fernando de Dilao. Of all the cemeteries, Tondo cemetery marked the most number of interments with 592 bodies followed by the Loma Chinese cemetery with 387 cadavers. The least numbers of inhumations occurred in Loma general cemetery, San Fernando de Dilao cemetery (different from Paco cemetery) and the smaller suburbs of Ermita and Malate. Figure 14 shows the number of dead bodies buried every day in each cemetery. The data provided for Loma general cemetery is problematic which will be discussed in the succeeding parts. Meanwhile, the appearance of another cemetery in San Fernando de Dilao which was distinct from the Paco general cemetery suggest that a provisional cemetery was opened during the peak of the epidemic crisis in 1882. Extant archival sources however were silent about this.

CEMETERIES	ADULTS						CHINESE	CHILDREN						TOTAL
	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General cemetery)	12	7	103	41	2	0	0	5	0	27	18	2		217
Tondo	0	1	239	188	11	15	0	0	0	81	47	7	3	592
Santa Cruz	1	0	89	67	8	9	0	0	1	23	25	4	3	230
Sampaloc	0	1	72	44	4	5	0	0	0	15	13	2	1	157
Loma (Chinese)	0	0	0	0	0	0	387	0	0	0	0	0	0	387
Ermita	0	0	31	22	0	0	0	0	1	9	7	0	0	70
Malate	0	0	24	23	0	2	0	0	0	7	10	0	0	66
San Fernando de Dilao	0	0	18	10	0	0	0	0	1	4	5	0	0	38
Loma (General cemetery)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paco (Niches)	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TOTAL	**13**	**9**	**576**	**395**	**25**	**31**	**387**	**5**	**3**	**167**	**125**	**15**	**7**	**1758**

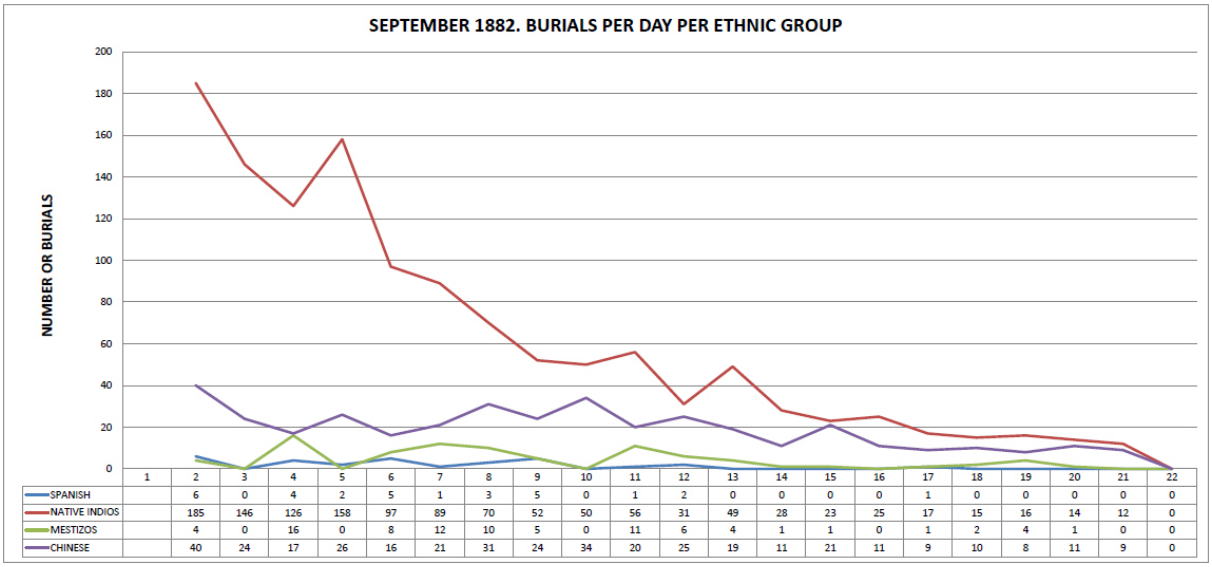
Table 5. Tabulated summary of reported burials from 2 to 22 September 1882 showing the different cemeteries in the capital classified according to age, sex, ethnicity.
Source: Costelo, 2020. Elaborated by using the data from the daily issues of *Gaceta de Manila* from 3 September 1882 to 23 September 1882.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Paco (General cemetery)		28	14	27	46	24	18	7	10	4	10	9	5	2	2	3	3	1	3	1	0	0
Tondo cemetery		107	65	62	53	46	42	28	28	23	32	11	25	16	10	12	6	8	7	6	5	0
Santa Cruz cemetery		22	26	27	24	20	16	19	13	10	8	8	9	3	4	8	2	2	4	3	2	0
Sampaloc cemetery		18	20	20	22	10	10	16	3	9	4	3	6	2	3	2	1	2	2	2	2	0
Loma (Chinese cemetery)		40	24	17	26	16	21	31	24	34	20	25	19	11	21	11	9	10	8	11	9	0
Ermita cemetery		5	10	4	8	5	6	7	2	2	4	2	3	2	3	0	2	0	2	1	2	0
Malate cemetery		8	4	4	7	4	5	4	3	0	6	4	4	3	1	0	2	3	0	0	0	0
San Fernando de Dilao cemetery		5	7	0	0	0	4	3	2	2	3	2	0	1	1	0	3	1	2	2	0	0

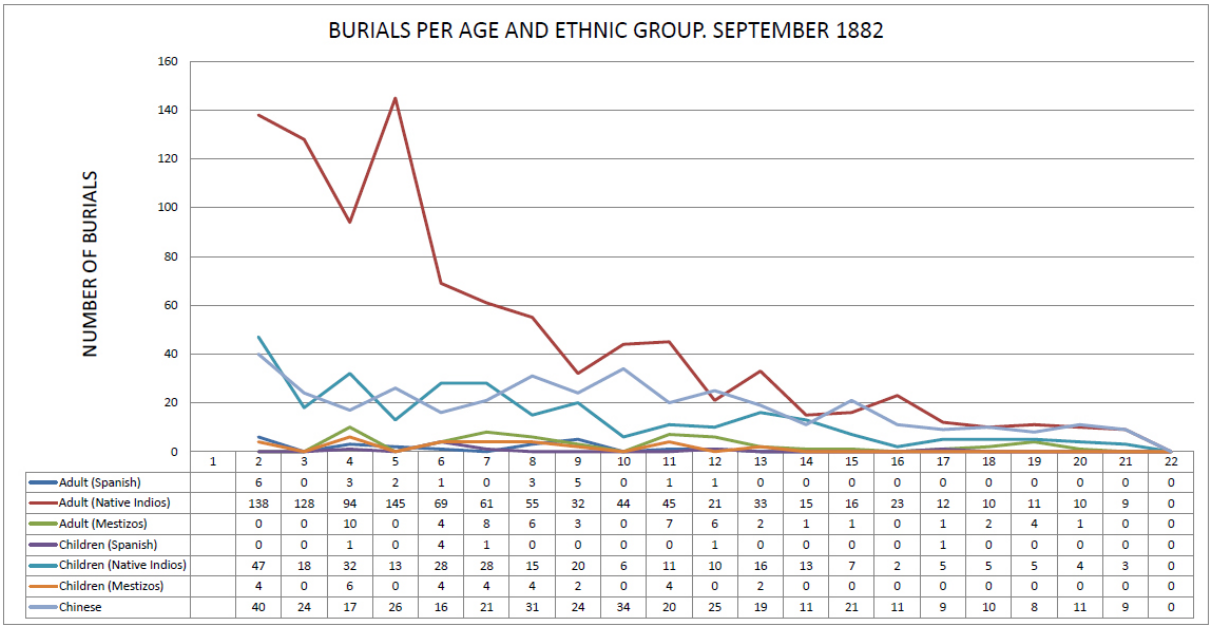
Figure 14. Burials per cemetery per day in Manila from 2 September 1882 to 22 September 1882.
Source: Costelo, 2020. Elaborated by using the data from *Gaceta de Manila*, Daily issues from 3 September 1882 to 23 September 1882.

At first glance, these daily accounts were definitely a far cry from the weekly and late reports when the epidemic first struck in August 1882. One significant improvement was a more nuanced presentation of mortality statistics which included ethnic and age categories. This information was inexistent in the August 16 to 31 reports of the colonial authorities. Figure 15 shows that most of the victims who perished from the epidemic were the native *indios* and the Chinese. It was not surprising then that the most number of registered inhumations were in Tondo cemetery that serviced the suburb where most natives resided and Loma Chinese cemetery which was the resting place exclusive for the migrants. The precarious urban living conditions of these ethnic groups in Manila characterized by scarce access to the best water supply, the very poor hygienic conditions and agglomeration of their habitation, and the lack of medical care were the evident factors that led to this misfortune. This observation can also be applied to the number of deaths per age as both adult and children natives were the most vulnerable groups as shown in Figure 16.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SPANISH		6	0	4	2	5	1	3	5	0	1	2	0	0	0	0	1	0	0	0	0	0
NATIVE INDIOS		185	146	126	158	97	89	70	52	50	56	31	49	28	23	25	17	15	16	14	12	0
MESTIZOS		4	0	16	0	8	12	10	5	0	11	6	4	1	1	0	1	2	4	1	0	0
CHINESE		40	24	17	26	16	21	31	24	34	20	25	19	11	21	11	9	10	8	11	9	0

Figure 15. Burials per day per ethnic group in Manila from 2 September 1882 to 22 September 1882.
Source: Costelo, 2020. Elaborated by using the data from *Gaceta de Manila*, Daily issues from 3 September 1882 to 23 September 1882.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Adult (Spanish)		6	0	3	2	1	0	3	5	0	1	1	0	0	0	0	0	0	0	0	0	0
Adult (Native Indios)		138	128	94	145	69	61	55	32	44	45	21	33	15	16	23	12	10	11	10	9	0
Adult (Mestizos)		0	0	10	0	4	8	6	3	0	7	6	2	1	1	0	1	2	4	1	0	0
Children (Spanish)		0	0	1	0	4	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
Children (Native Indios)		47	18	32	13	28	28	15	20	6	11	10	16	13	7	2	5	5	5	4	3	0
Children (Mestizos)		4	0	6	0	4	4	4	2	0	4	0	2	0	0	0	0	0	0	0	0	0
Chinese		40	24	17	26	16	21	31	24	34	20	25	19	11	21	11	9	10	8	11	9	0

Figure 16. Burials per age and ethnic group per day in Manila from 2 September 1882 to 22 September 1882.
Source: Costelo, 2020. Elaborated by using the data from *Gaceta de Manila*, Daily issues from 3 September 1882 to 23 September 1882.

In general terms, however, the official data presented in *Gaceta de Manila* was evidently sketchy, hazy, and incomplete. The most glaring problem of this official data was the absence of an accounting of burials that were made in the La Loma general cemetery from September 2 to the succeeding days. La Loma cemetery only appeared in the official reports beginning on 21 September 1882, but with a highly suspicious accounting of zero burials for the day. Archival records show that by the first week of September, it was already being used for inhumation of the cholera victims of Manila. In fact, on 2 September 1882, it was reported that cemetery inspector José María Lago and medical doctors Quintín Meynet and Emilio Fernández conducted inspections in La Loma cemetery. The continuous high number of deaths in August and the immediate disposal of cholera-related cadavers prompted the digging of six open pits that were nine feet deep. Perhaps the number was just too many that it was practically impossible to count the inhumations in La Loma? One thing was certain though. The bothering state of infection and rottenness of the cemetery site impelled the undertaking of disinfection measures in the area. The municipal authorities ordered the burning of barrels of tar and sulphur during the day and night to decontaminate the graveyard as well as the administration of quicklime and salt in the execution of burials in Loma.[140]

[140] ¨Noticias¨, *El Comercio*, 2 de septiembre de 1882.

More importantly, despite the reported slowing down of deaths after the first week of September, it was still practically impossible that a sudden drop to zero cholera-related burials in all cemeteries took place on 22 September 1882. Perhaps, this was what the *Diariong Tagalog* was referring to when it accused the government of misrepresenting the real situation on the ground by using distorted figures. It called on the government to ¨use statistics, its numbers and categories to publish the right figures in an exhaustible manner so that the public can discern if indeed the epidemic is diminishing¨ and that ¨men of science could distinguish the symptoms and effects of this disease to all ages, both sex, and diverse living conditions¨. Believing in the utility of statistics and the importance of transparency from the authorities, the periodical added:

> Statistics with its numbers and classifications, its calculations and comparisons, will allow us to appreciate a number of truths that, together with other [fields]s of purely scientific order, will give over time to men, the complete understanding of this terrible disease since it was first known by men in Europe...To silence these truths in the current times is evil. The process of civilization demands all the reports that those obliged to do so must provide.[141]
>
> *Ang estadistica sa caniyang mga numero at pagpuputa- putaqui at sa pag susurot surot ay mag papaquilala ng di mau-ulatang catitohanan, na cung ilalaquip sa iba pang linilining ng ciencia ay macapagtuturo rin sa tauo ng malaon ng hinahangad matutuhan, buhat ng una pang maquilala sa Europa itong caquila quilabot na saquit... Ilihim ang catotohanang ito sa panahong lumalacad ay macasasama; ang civilización ay nagcacai langan ng lahat ng informeng dapat ilagda ng ma-catungculuan.*

Diverse narratives, Different responses

The idea that even death should evoke an image of colonial modernity resulted to the laying out of mechanisms of surveillance and control towards achieving a scientific, efficient, sanitary, orderly and well-groomed death, or at least its management. The cemetery became the territory of control of hygienists, medical doctors, and urban reformers. As discussed in the first part of this chapter, these apparatuses of scrutiny and supervision were embodied in the many regulations and edicts that were promulgated by the colonial government through time. During times of epidemics and cemetery crises, the authorities´ turned even more to the graveyards as

[141] ¨Cailangan/ De Necesidad¨, *Diariong Tagalog*, número 79, 5 de septiembre de 1882. La estadística con sus números y sus clasificaciones, sus cálculos y sus comparaciones, permitirá apreciar un sinnúmero de verdades que unidas a otras de un orden puramente científico, darán con el tiempo la completa enseñanza a los hombres desde que por primera vez se presentara conocidamente en Europa esta terrible enfermedad… Callar estas verdades en los actuales tiempos es un mal. El proceso de la civilización reclama todos los informes que los obligados a ello deben dar.

sites of control. For instance, the cemetery was transformed into a gated, and distant urban space as public hygiene concerns intensified. Many animal owners were fined, or worse imprisoned, for letting their animals graze around the cemetery. During the height of the epidemics, the urban police imposed severe state surveillance and vigilance to the grazing activities in the La Loma Cemetery for fear of aggravating the spread of the illness in the capital.[142]

As already demonstrated, a mortuary where cadavers were deposited for their proper identification and recording before burial was included in the physical lay-out of the cemetery. It also included an autopsy room as an attempt to place a sanitary infrastructure within the burial grounds especially in cases of epidemics or in contentious deaths. For efficient and controlled burial management, individuals appointed by the civil and municipal government were positioned in the cemetery to carry out specialized tasks. The cemetery inspector, guards, and gravediggers were expected to maintain the site´s cleanliness and the observation of the cemetery rules. Regulating the cemetery meant the implementation of *sanitary regulations* involving burial for the safeguard of public health which included regulations on the depth of graves, prescribed areas for interment, etc.

Some of the grave diggers´ stories could very well reflect some contensions within cemetery management. Official accounts document the several cases of grave diggers who were penalized (either imprisoned or fined) because of their supposed violation of the cemetery rules. Given the rising fees on burial spaces, many natives resorted to clandestine burials in the public cemetery. Many natives directly went to the grave diggers, who were also natives, for the clandestine burying of their dead for a lesser fee. On 24 January 1883, it was reported that around 3:00 o´clock to 4:00 o´clock in the afternoon, four grave diggers of the La Loma Cemetery were arrested for supposedly violating the burial rules and regulations imposed by the municipal government. According to the report, grave diggers Wenceslao Parulan, Cesario Olanda, Inocencio Dionisio and Sebastian Lorenzo, were involved in the secret and illegal burying of the dead in the said cemetery. Supposedly the four workers of the La Loma demanded one peso so that a child (*párvulo*) could be buried in the cemetery. Unfortunately, the family of the dead was not able to raise the said amount. This caused displeasure among the grave diggers. The report said that the four maltreated the family of the deceased. Violent words and actions were allegedly inflicted by the four grave diggers to the family. After an

[142] AF-BTNT-CCHS-CSIC, Animales Sueltos, Microfilm Roll 7527, Informes de la Guardia Civil Veterana, 1 de octubre de 1879.

investigation, José María Lago, the cemetery´s inspector general, reported to the central government that the four were found guilty of practicing clandestine burial and of bad behavior. As a result, the four identified grave diggers were sent to the Bilibid prison for thirty days.[143]

Also, on 27 January 1883, Lago reported that after undertaking vigilance and observation, four more grave diggers were found to be unfit for the job due to different violations of cemetery regulations and their ¨bad behavior¨ (*mal comportamiento*). The offenders were Donato de la Cruz who was assigned in the Paco General Cemetery and José de la Nieva, Mateo de la Cruz and Pedro Sevilla who were stationed in the La Loma General Cemetery. While it was unclear what constituted the offense, the authorities deemed that the grave diggers´ actions merited their immediate expulsion from the service. By 1 February of the same year, the inspector communicated to the higher authorities that Francisco Tuason, Mariano Evangelista, Cayetano Valderas, and Branlio de la Cruz replaced the posts vacated by the four offenders.[144] All these accounts took place several months after the epidemic peak on August-September 1882.

Other times, the grave diggers just openly resisted the performance of their duties perhaps due to fear of contagion and the dreadful idea that they could be the next victim of the infectious malady. For example, on 3 September 1882, a ¨small disturbance¨ (*alboroto pequeño*) took place in La Loma cemetery when a number of Chinese grave diggers resisted the application of quicklime and salt to the open pits and cemetery grounds. These agitated and restless grave diggers had to be neutralized by the *Guardia Civil Veterana* and the *Cuerpo de Bomberos* which caused physical injuries to some of the grave diggers.[145] Discontent came not only from the precarious working conditions of the grave diggers but also their ill-compensation. No less than the cemetery inspector asked the municipal government´s action to resolve the insufficiency of funds to compensate the grave diggers of the capital´s two general cemeteries. The cemetery inspector lamented that the said cemetery workers were required to continue working without proper compensation for months. He warned the municipal government´s serious effects to this neglect especially with the risky type of work that they undertake.[146]

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[143] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1130915, Informe del inspector sobre los abusos de los mozos sepultureros, enero de 1883.
[144] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1213066, Informe del inspector José María Lago sobre el cementerio, 27 de enero 1883.
[145] ¨Noticias. Local¨, *Diariong Tagalog*, Año 1, No. 79, 5 de septiembre 1882.
[146] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 7446, Expediente sobre autorización al Ayuntamiento de esta Ciudad para que continúe librando lo que importan los sueldos de los mozos sepultureros de los Cementerios de Dilao y La Loma, Manila, 8 de marzo de 1883.

During the height of the epidemics, the state´s apparatus of social control was put to the test in its efforts to detect and isolate the disease´s foci of infection. Some houses and barracks were demolished in Manila. This was the case when the structures in the *Malecón del Norte* were declared as foci of infection where the disease reigned over the place and where the first cases appeared to have taken place. Fumigations and bonfires were also put in place not only in cemeteries but also in streets and public spaces. Municipal authorities reported that wood with tar and sulphur if burned produce large quantities of smoke believed to be able to purify the atmosphere from unhealthy miasmas. Orders invoked that these bonfires were to be kept lighted both at day and night.[147]

Many times, the colonial government tossed the blame to the natives´ and Chinese´ customs and living habits in the propagation of the disease. Mechanisms of surveillance and vigilance not only to the natives but more so to the large Chinese community known for their squalid living and death habits in the capital were imposed. Colonial authorities, both civil and religious, were most concerned with regard the Chinese habits, whose cemetery was just beside the La Loma general cemetery. Several reports complained about the burial habits of the Chinese, from the fiestas they organize, to the burning of candles and incense, to bringing in of food inside the cemeteries, up to their practice of not properly sealing and nailing coffins and their resistance to apply quicklime in the niches.[148]

In funeral processions, natives were known for wrapping their dead with clothes and mats that the person used while alive. The authorities criticized that most of the times, the families of the deceased could not dispose these belongings properly thereby leaving these things on streets. Furthermore, natives typically use coffins for rent to bring the dead to the final resting place. These and other more practices were believed to spread the foci of infection. [149] As a consequence, obligatory house visits and inspection were intensified penetrating even the most private habits and practices of the capital´s residents. The custom of holding long wakes to honor the dead was prohibited as cadavers should be buried rapidly. Carriages that carried coffins to the cemetery were compulsory, prohibiting the loved ones of the dead to personally carry and accompany the latter to their final resting place.[150]

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[147] *La Oceanía Española*, Año VI, No. 203, 5 de septiembre de 1882.
[148] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1130915, Sobre abusos cometido de los chinos en el cementerio, 4 de marzo de 1882.
[149] ¨Costumbres¨, *Diario de Manila,* año xxxiv, no. 202, 5 de septiembre de 1882.
[150] *Recopilación de las instrucciones que deben observar los gobernadores de provincial y las autoridades locales para prevenir el desarollo de una epidemia o enfermedad contagiosa o minorar sus efectos.*

Diariong Tagalog, in its editorial on 19 September 1882 recognized that while such measures as well as the opening of La Loma cemetery were important, additional reforms were still needed in order that the capital´s residents, especially the poor, would be able to observe the sanitary norms related to burial. The paper defended that the natives´ perceived resistance to the cemetery and burial norms was not a simple up-front display of resistance to colonial policies but actually a result of their economic decrepitude and helplessness. For them, the compliance of these sanitary measures was tantamount to further monetary misery in addition to the sorrows of precipitous loss of family members and loved ones due to a ravaging disease. It urged the colonial authorities to favour the poor natives by providing free inspection of cadavers by medical experts, the provision of stretchers (*camillas*) for the conduct of cadavers, and the availability of burial carriages especially for the arrabales that were in great distance from the new cemetery of La Loma.[151]

The plight of the poor was even more magnified in the cemetery context. Exorbitant burial fees became even more a source of agitation and disquietude in times of epidemic as the urban poor residents grappled with illnesses, deaths, and many layers of economic adversities. Even the newspaper *El Comercio* raised concerns on the practice of requiring the poor families to pay the amount of 4 reales or one peso even during the height of deaths caused by the 1882 epidemic. It was not a simple economic matter. More importantly, it was a hygiene concern. The more people were being denied of accessible, safe, and hygienic burials, the more risk of contagion could arise as people resulted to unregulated. uncontrolled, and contamination-prone burials. Cemetery inspector Lago, who was also member of the Manila city council[152], championed for the temporary revocation of this policy and pushed for pro-poor burial norms. Out of compassion, he reportedly allowed the burial of the less unfortunate even without the necessary payments.[153]

Throughout the century, the religious groups were the most consistent in challenging the burial practices reforms imposed by the civil government. With La Loma cemetery´s opening, the government ordered the closing down of all other parish cemeteries to minimize the city´s hotspots of infection. During the peak of the 1882 epidemic, accounts were sent that unregulated and clandestine burial in their houses or abandoned lots. [154] Furthermore, it was

[151] *Diariong Tagalog*, año 1, número 90, 19 de septiembre 1882.
[152] Huetz de Lemps (2017), p. 219. Lago, a merchant and proprietor, served the city council of Manila on 1873-1874 and the years 1881-1889.
[153] ¨¡Por compasión!¨, *El Comercio,* año XII, número 1192.
[154] NAP, AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1213065. Informe de Francisco Paja, 4 de junio de 1883.

reported that the parish priest of Sampaloc was complicit when he permitted the continued inhumations in the graveyard despite the ban.

However, he insisted that from September 1882 to the first months of 1883, his position as priest was tested by the innumerable parish priests, desolate mothers and suffering families who were all looking for available burial space where they can put their dead to rest. He added that as much as he tried to follow the central government´s order on the closure of other cemeteries in the arrabals and the prohibition of their use, he maintained that the condition of Paco and La Loma were not suited for their purposes.

The problem is the prohibition seemed to exclude those who are or those who have access to power. The parish priest of Sampaloc defended himself by saying that the inspector of La Loma Cemetery himself, José María Lago, asked him to find a niche for a deceased person named Don Telesforo Gertucha. This was the same case when the *alcalde de 2ª elección* José Muñoz also asked for another burial space in the arrabal cemetery. In the end, the parish priest appealed to the superior government that it was not his intention to disobey its laws and that his mistake was that he gave concessions to the requests of the government´s ¨first hand representatives¨ (*inmediatos delegados*). He ended his letter of appeal that he could be ¨a victim of false assumptions¨ (*una víctima de falso supuesto*) but he never defied the central government´s policy on disposal of the dead especially during the height of the epidemics.[155]

The Sampaloc parish priest´s appeal was supported by the Archbishop of Manila and lamented that the arrabales located on the right bank of the Pasig river suffered seriously in the disposal of their dead due to the inaccessibility of La Loma. The distance of the new general cemetery was not advantageous for the residents in arrabal. He also noted that this situation was further aggravated due to the sorry state of the roads towards the new burial ground of the capital. He added that given this state, colonial officials should not be surprised with the refusal of the city´s inhabitants to place their dead in the new cemetery. In fact, he even cited the alarming increase of cases of clandestine burials. According to the report, more and more natives preferred burying their dead within the vicinity of their houses, private properties, and even in isolated fields.[156]

[155] NAP, AF-BTNT-CCHS-CSIC, Microfilm Roll. Roll 1213065. ¨Carta del cura párroco de Sampaloc¨. 3 de junio de 1883.
[156] NAP, AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1213065, Informe de Francisco Paja, 4 de junio de 1883.

The rising civic consciousness of Manila´s residents echoed through their increasing engagement with the colonial authorities´policies and participation on the formulation of solutions to address the public health and order challenges. While recognizing that sanitation measures be undertaken in cemeteries, some urban residents also appealed that these steps be observed near their homes and settlements. For instance, on 3 September 1882, the residents of San Nicolás in Binondo represented by Juan Zulueta, Felipe Simplicio Hipolito, Miguel Vidal, Luis Munji, Nicolás de los Reyes, Zacarías Gómez. José Álvarez, Manuel Rodríguez, Cornelio Almeyda, and José Santos Salazar wrote to the city council and inspector of the district that the dumping of wastes by public garbage carts on the nearby Lavezares Street be terminated in the goal of ¨ensuring cleanliness and public hygiene and eliminating any source of infection¨. They recommended that a new site that was not harmful to the residents´ health be identified or that the accumulated city trash be burned.[157] A week after the publication of this request, a notification was published that all garbage were to be incinerated every day.[158] This was almost the same argument of a group of concerned residents in Barcelona Street, also in Binondo, when they identified the worse state of sewers and drains in the said street as similar to the cemeteries with the ¨pestilent miasmas that they emit¨. According to them, the situation had been reported several times already but nothing came out from the previous complaints. [159] In times of the epidemic outbreak, the residents were more adamant in demanding response from the colonial authorities.

Looking for alternative cemeteries

While the arrabales on the right side of the Pasig river found a new interment site for their dead in La Loma Cemetery, those on the left side of the bank which consisted of Paco, Ermita, and Malate were still faced with the problem of finding an alternative cemetery that would service the inhabitants.[160] On 2 October 1882, this concern was expressed by the parish priests of the three suburbs, Fr. Santos Paredes, Fr. Miguel Rubén, and Fr. Gilberto Martín, and their *principalías* to hasten the construction of a new cemetery on the left side of the river bank. According to them, the cholera epidemic had left no more space for interment in the cemetery of Paco and the smaller parish cemeteries of Malate and Ermita suburbs. They also added that

[157] *La Oceania Española*, Año VI, numero 203, 5 de septiembre de 1892.
[158] *La Oceania Española*, Año VI, numero 206, 10 de septiembre de 1992.
[159] *Diario de Manila*, 5 de septiembre de 1882.
[160] *Diario de Manila*, Año 34, número 200, 2 de septiembre de 1882.

although La Loma cemetery was already opened for the burial of the capital´s residents, the site was inaccessible in relation to the three aforementioned suburbs. Citing this problem of remoteness, the parish priests noted that ¨the distance of the La Loma cemetery would generate extreme difficulty and expensive funerary service for the transport of the mortal remains from these parishes to the other side of the river especially during the rainy season¨. These concerns were valid as the remains of the deceased would have to pass through the increasing number of houses in Paco, Malate, and Ermita, cross the Pasig river, and then traverse again the many dense suburbs on the other side of the bank such as Quiapo, San Miguel, Santa Cruz, etc.

After reconnoitering the unused lands in Paco, Malate, and Ermita a proposal was made to turn the grounds beside the Fort of San Abad into a new cemetery. Because of its original use as a fort and an ammunition dump (*polvorín*), a study had to be done to describe the location and its peculiarities. Despite the inhibitions presented by the military captaincy of the city due to the fort´s primary function for the defense of the city, the urgency and the gravity of the problem pushed for the colonial authorities in Manila to use the vicinity for the burial of cholera victims in the barrios to the left of Pasig. Some requirements were imposed by the military captaincy of the capital: first, that the captaincy be informed of all materials to be used in its construction instructing that the fence be erected with masonry as base, with a maximum of 40 centimeters height and .20 meters thick, and the chapel and other structures be constructed with light building components; second, that the new burial site be situated at least 200 meters away from the fort; and that it should be flattened to the ground should the cemetery serve as obstruction for the defense of the city in the future. After an examination was made by the IGOP, it affirmed that the plot offered acceptable ¨topographic conditions, good orientation, elevation, isolation, and distance to the capital´s dense settlements¨ (*situación topográfica, buena orientación, elevación, aislamiento y distancia de los pueblos*)¨ requirements that were essential in the construction of a cemetery as shown in the cemetery plan authored by engineer José García Morón in Figure 17. On 12 January 1883, the request was approved ordering the conversion of the lands 200 meters away from Fort San Antonio Abad in Malate to be used as a burial site. [161]

[161] AHN, Ultramar, 521, Exp.16, Autorización para la construcción de un cementerio junto al Fuerte de San Antonio Abad en Manila, 1882.

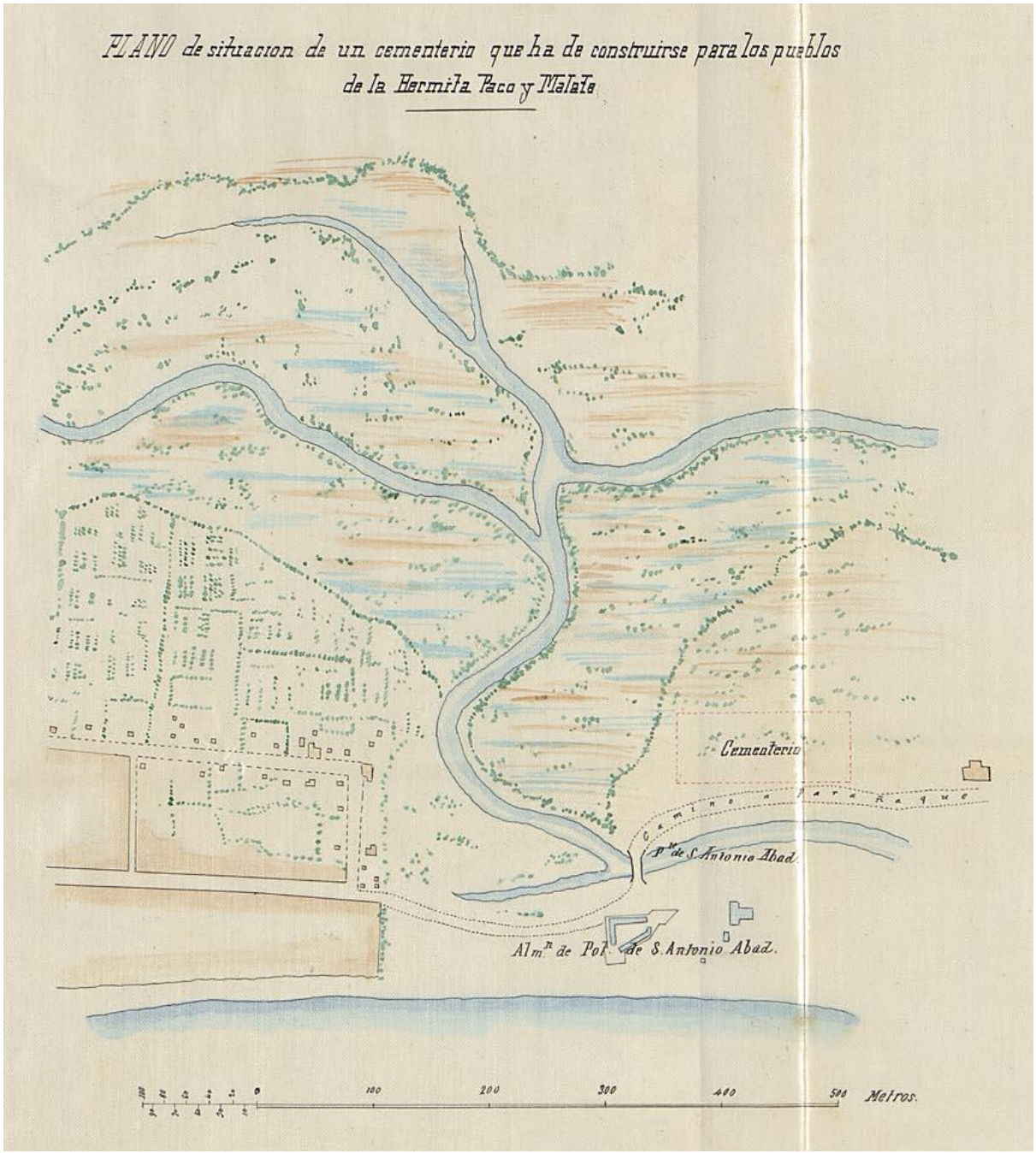

Figure 17. Plan showing the location of an alternative cemetery in 1882 for the arrabales of Paco, Ermita, and Malate on the left side of the Pasig river bank.
Source: AHN, Ultramar, MPD.[162]

When the panic and horror of the 1882-1884 waves of death slowed down, several petitions of opening new cemeteries were pushed by the natives, especially among the elites. This was the case when in 11 June 1884, the principales of Binondo represented by Vicente Olegasio, Benito Ignacio, Marcelo Bonoan, Felipe Dy Suyco and around forty other principales

[162] AHN, Ultramar, MPD. 5425, Plano de situación de un cementerio que ha de construirse para los pueblos de la Hermita, Paco y Malate, Manila, 4 de octubre de 1882.

with the support of the parish priest of Binondo Fr. José Heria Camp pushed for the construction of a separate cemetery that is closer to the said suburb. [163]

Colonial officials attempted to replicate and implement the cemetery reforms beyond the capital. Civil officials with the help of parish priests were instructed to furnish reports on the state of the different town cemeteries across the archipelago. These reports evidently demonstrate the increasing preoccupation of the government to address issues related to population, death, burial, sanitation and public health. The reports include the location and distance of the cemeteries in relation to the town centers. Information about the characteristic of the soil and terrain were also provided. The following table for instance documents the status of the different town cemeteries in the province of Tayabas in 1888, the population per town, the cemeteries distance to the settlements, the burial grounds location in relation to the town, its size and land area, the land´s soil type, the materials used in the construction of the cemetery structures and the existing constructions in the burial ground.

Towns	**(Number of Inhabitants)**	**Cemetery´s Distance from the town**	**Cemetery´s Location in relation to the town**	**Soil type**	**Land Area**	**Condition of the Town Cemetery**
Tayabas	15,957	451 meters	to the west	soft clayish soil	6,473 sqm.	With stone fence and an iron gate with its corresponding lock and key
Lucena	5,497	418 m.	to the north	rocky soil	3,000 sqm.	With bamboo and wood fence and an entrance made of bamboo
Sariaya	7,112	90 m.	to the west	clayish soil	7,008 sqm.	With stone fence and an entrance with corresponding lock
Candelaria	3,366	96 m.	to the south	soft soil	7,700 sqm.	With bamboo and wood fence and an entrance made of bamboo without lock

[163] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1213066, Petición de principales de Binondo para un cementerio, 11 de junio de 1884.

Tiaon (Tiaong)	6,643	79 m.	to the south	soft soil	95 sqm.	With a stone fence of 1.5 meters high and an entrance made of bamboo without lock
Dolores	2,103	66 m.	to the south	hard soil	140 sqm.	With bamboo and wood fence of 1.5 meters high an entrance made of bamboo without lock
Lucban	10,218	146 m.	to the northeast	clayish soil	4715 sqm.	With a stone fence of 3.6 meters high and an iron gate with its corresponding lock and key
Mauban	8,962	76 m.	to the northeast	hard soil	1,512 sqm.	With a stone fence of 1.5 meters high and an iron gate with its corresponding lock and key
Alimonan	9,506	167 m.	to the southeast	sandy soil	60 sqm.	With a stone and wood fence of 3 meters high, the gate is still in construction in Lucban
Gumaca	7,404	220 m.	to the northeast	clayish soil	1,764 sqm.	With a stone fence and a wooden gate with corresponding lock
Lopez	7,512	200 m.	to the north	soft soil	1,140 sqm.	With a wooden fence of 2 meters high and a wooden gate with a lock
Calauag	1,706	145 m.	to the west	soft soil	65 sqm.	With a wooden fence and a gate made of bamboo

Guinayangan	2,201	38 m.	to the northwest	sandy soil	735 sqm.	Live trees serve as fence, the cemetery has a gate which is always open
Pagbilao	4,514	41 m.	to the south	soft soil	1,737 sqm.	With a fence made of *tangal* and a gate without lock
Unisan	1,801	33 m.	to the southeast	sandy soil	1,370 sqm.	With a stone fence of 1.5 meters high and a gate with a lock
Pitogo	2,500	33 m.	to the northwest	sandy soil	36 sqm.	With a stone fence of 1.6 meters high and a gate with a lock
Macalelon	3,426	167 m.	to the west	hard soil	676 sqm.	With a stone fence of 1.5 meters high and a gate with a lock
Catanauan	3,816	38 m.	to the northwest	sandy soil	735 sqm.	With a fence made of *tangal* and a gate without lock
Malanay	1,512	85 m.	to the north	sandy soil	1,280 sqm.	With a wooden fence but a gate is lacking
San Narcisa	2,178	234 m.	to the east	hard soil	1,932 sqm.	With stone fence of 1.5 meters high and a gate with corresponding lock

Table 6. Report on the situation of the cemeteries in the province of Tayabas, November 1888
Source: AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1213065[164]

[164] AF-BTNT-CCHS-CSIC, Cementerios, Microfilm Roll 1213065, Relación detallada de la situación que ocupan los cementerios de esta provincia con expresiones de la distancia en que están construidos, superficie, clase de cerco de puertas y cerrojos que tiene cada uno, Tayabas, 16 de noviembre de 1888.

Chapter Concluding notes

The first cemetery reforms in the Philippines arguably were ripples of the grand societal and ideological transformations of the eighteenth century Enlightened Reformism. By the nineteenth century, the burial space became a site of reform of the liberal modernist discourse characterized by hygienic, organized, and controlled burial spaces. Paco general cemetery was envisioned in the early nineteenth century as the *ideal* burial site in the *extramuros* taking into consideration the primacy of the ¨city¨- Intramuros. However, it was not the *ideal* location in reference to the many arrabales that were on the other side of the river. Eventually, the course of urban development in Manila revealed the decreasing vitality of Intramuros in the nineteenth century. By this time, the real burgeoning ¨city¨ was the streets and arrabales on right side of the river bank brought by the population explosion and increased urbanization. With the successive epidemics throughout the century that saturated the capacity of Paco cemetery and other small cemeteries in the capital, the conversion of the lands within the vicinity of Paco to residential areas, and the demands of the arrabales on the right bank of the river for a more accessible cemetery, it was time for Manila´s authorities to identify and construct a new cemetery that would address the worsening sanitary problems of the capital. With La Loma cemetery, public hygiene and urban reformers attempted to integrate the elements of a more modern and secularized cemetery as the city faced heightened urbanization and growing concerns on public health and order, increasing class stratification, intensification of capitalist modes of production and consumption as well as the emergence of political and intellectual ideas in the context of colonial reforms. In the nineteenth century, the cemetery reforms paved the way for the general secularization and municipalisation of cemetery administration in Manila.

This chapter attempted to demonstrate the interaction of disease and death and the changing and contending mentalities towards public health, urban space, burial practices, and death infrastructures. The cemetery as an urban space highlighted, if not uncovered, the existing social and ideological tensions in colonial Manila with the Religious sectors and the natives openly or reluctantly resisting the burial reforms. Indeed, the cemetery was no ordinary urban space- the cemetery question was far more complicated because it was a *sacred* urban space. With this considered, the cemetery became a site for quotidian conflicts, resistance, and dialogue in the context of colonial rule.

In the previous pages, the story of cemetery construction was also closely linked with the city´s history of epidemics and diseases as well as the story of its physical expansion and rapid growth. As demonstrated by the archival sources, the debates concerning death infrastructures persisted and became more intensified during periods of disease explosion such as in the 1790s, 1820s, 1860s, and 1880s. These occurrences proved to be turning points and impetus for the colonial government to push for cemetery and burial practices reform in colonial Manila. In times of low mortality rate, the colonial authorities seemed to have shoveled the matter to the side and urgency was not the order of the times. However during times of catastrophes brought by epidemics and calamities, we witnessed how the colonial government and the colonial society in general viewed the cemetery crisis brought by these maladies as well as the decision-making process of the colonial authorities in relation to addressing the sanitation and public health problems. The interplay of powers from the local authorities in Manila (which include the *regidores* and the *alcaldes*), the central colonial government, the authorities in Madrid, professionals in the nineteenth century including doctors, health experts, architects and engineers, and the religious resulted to a more complex process that involved the creation of commissions and debates on urban configuration, how the lands were chosen as well as the suitability of the cemetery design. While Western ¨modern¨ models were introduced, some local customs on burial were not wholly abandoned. Indeed, there were attempts to introduce modernity especially in the latter part of the nineteenth century but these modernist ideas were trapped in the colonial realities of a resource-scarce, epidemic and disaster-prone colony and to the myriad local realities of the Philippine colony- realities that painted a very complex heterogeneous population, the persistent power of the Church and the religious, the strong cultural and traditional beliefs with regard loss and interment, and the heightened inequality in the economics of death.

When the Americans took control of the Philippines, they continued the use of Paco and La Loma cemeteries in Manila. Recognizing the suitability of the vicinity of La Loma, the American colonial government bought in 1904 a 125-acre land beside the said cemetery to address the expanding needs of interment space for the growing capital. The cemetery was eventually called *Cementerio del Norte* or North Cemetery.[165]

[165] *Annual Report of the Manila Municipal Board,* 1905, p. 85.

CONCLUSION

In the introductory part of this dissertation, we posed the following questions that this research hopes to answer. What colonial challenges did the public works projects represent? How did these projects reflect the visions, achievements, and weaknesses of the empire? What do these infrastructures tell us about the second half of the Spanish administration in the Philippines and the changing views, attitudes, and technologies concerning salubrity, order, and the built environment through time? How did the interplay of urban policies and people´s responses aid in understanding the metamorphosis of Manila?

This investigation is a study of the development of public works in Manila as the colonial city experienced immense changes, growth, and complex problems brought by urbanization and modernization. The late eighteenth and nineteenth-century period of large-scale global and local paradigm shifts played a central role in the conception and configuration of Manila´s urban environment. Influenced by the changing mentalities of European city organization, the aspirations of enlightened urbanism as well as of the growing realization of the local realities of the colony, colonial administrators began to reimagine and rethink the capital in the late eighteenth century. This reimagination was more intensified with the introduction of liberalist ideas and notions of modernity combined with Manila´s unprecedented socio-economic transformations and its increasing incorporation to the global arena in the nineteenth century. Manila´s urbanization and population explosion were manifestations of the political, ideological, and socio-economic developments that took place during this period. However, problems of sanitation, order, and control became major consequences of this growth and expansion. It became clear that necessary reforms had to be introduced for the better administration of the Pacific territory.

Soon, the burgeoning city became a threat to public health and security. The city´s deteriorating condition was aggravated by the spread of infectious diseases and waves of cholera epidemic. The unregulated, chaotic, insalubrious, and congested streets as a consequence of unsystematic construction practices and uncontrolled movement of peoples and their activities became sites of concern for the Spanish administration. Urban reconfiguration and street reforms were imperative to solve the insalubrity and disorder

of the thoroughfares and public spaces. These paved the way for their construction, improvement, embellishment, and illumination. The city´s insufficient and unsafe water and food sources, as well as systems of provisioning also worsened Manila´s predicament. The rivers and esteros suffered as the population continued to swell and densify. These conduits that traditionally nourished Manila´s inhabitants were soon transformed as generators of illnesses and maladies. Food supply also became a city concern as authorities began regulating their sources and distribution. Safe and sanitized food meant healthy and robust population. The city administrators realized that ensuring clean water and secure food for the capital was just as important as the eradication of contagion epicenters in the city. For the city hygienists, another contributor to these growing centers of infection was the cemetery. The image of overcrowded decomposing bodies and the stench of noxious airs emitted from the burial grounds concerned the city as the recurring crisis of disposing of the dead in parish cemeteries adjacent to settlements troubled the people especially in times of epidemic outbreaks. As ideas of public health and hygiene developed, the city soon identified the streets and dwellings, the rivers and esteros, slaughterhouses and markets, and burial grounds as spaces where disease, contamination, chaos, and disorder reign. The sights, tastes, and smell of a congested city, the insecurity of unilluminated streets, the taste of intoxicated water from polluted river and esteros, the public display of animal blood and waste, and the fetid and reeking cemeteries affected the sensibilities of an urbanizing and modernizing capital.

This *city problem* was not exclusive to Manila. It was a problem that swept cities around the world- from the imperial centers to their colonial capitals. In the Spanish Peninsula, it was a period of immense urban reconfiguration and transformation as comprehensive plans for its major cities were conceived. In the more advanced European cities, the problems of contaminated cities due to industrialization and urbanization gave way to the emergence of new ways of thinking and the advent of a myriad of technological solutions for urban problems. These developments were translated into the fields of engineering and science, medicine and public health, and urban planning. In Spain, specialized technical and engineering institutions soon emerged which produced a new breed of techno-scientific experts not only for the Peninsula but for the colonies as well.

The advent of engineers and architects with more specialized and highly technical training was central to the conception and design of many public works projects in

Manila. The period was also marked by efforts to standardize and centralize the public works projects. An indication of this was the creation of public works committees, advisories, boards, and commissions. As carriers and mediators of new knowledge, the engineers employed emerging technologies beyond the Spanish realm. Their wide contacts and openness to the larger techno-scientific community demonstrated in the blueprints and implementation of public works projects. Thus, French and British influence and technologies characterized the nineteenth-century infrastructure projects in the Philippines. These endeavours were no longer ¨Spanish projects¨ in the strictest sense of the term as the previous chapters demonstrated that these became dynamic spaces open to transnational and indigenous involvement, engagement, interaction, exchange and intervention of various actors and mediators that moved beyond the confines of the empire´s borders. It is also interesting to note that many of these engineers spent a good number of years in the archipelago which was crucial to the better understanding of the local realities and contexts of the colony.

Aside from these technical experts, medical and sanitary professionals were also crucial in the configuration and reconfiguration of Manila´s built environment. In Spain and Europe, the period was characterized by the creation of sanitary institutions designed to oversee the health concerns of the people and the emergence of new discourse towards public health and hygiene. In Manila, military and civil medical doctors employed these emerging hygienist ideas in analyzing the public and private health conditions of the capital and adopt solutions in the eradication of contagion centers in the city. Atmospheric conditions, humidity, ventilation, alimentation, social and body habits were scrutinized to understand the urban living conditions in Manila. In the previous chapters, we saw the convergences and divergences of urban policies designed by the authorities and the viewpoints of medical sanitary professionals. The engineers, techno-scientific experts, medical doctors, and sanitary reformers became chief contributors to the modernization project as they carried with them a new brand of specialized knowledge and scientific know-how that were central in devising technical-scientific solutions to address Manila´s urban questions.

The role played by the Ayuntamiento or the city council was central in the conception of the public works projects. The increasing administrative reach of the Ayuntamientos and the powers given them brought by the legislative reforms of the

nineteenth century made possible these infrastructure ventures. The past chapters presented to us the municipalization of these infrastructure projects as the Ayuntamiento became actively involved in the planning and implementation of urban structures and services. It must be emphasized that the changing composition of the city council with the increased participation of creoles or *españoles filipinos* (Spaniards born in the Philippines) contributed greatly to the impetus of the modernizing projects in the capital.

However, the concretization of many of these infrastructures was consistently hampered by the many limitations of the empire. The problem of funding and resources was one of the principal impediments to the speedy realization of the public works projects as seen in the hydraulic infrastructures of the city. Sometimes, a project was not just the priority in a given time. For instance, the shift from kerosene and oil lamps to gaslights took a long while because the government´s resources were focused on the costly waterworks project in the 1870s. In Manila, the gaslight and electric light technologies almost overlapped due to the former´s delay. In other cases, it was a combination of lack of funds, colonial lethargy, and consistent resistance against a specific project. Such was the case of the cemetery crisis that brought problems to Manila for almost the entire century. However, the worsening urban conditions and the intensifying calls for salubrious and secure communities among different stakeholders of the capital showed that reform projects could no longer be delayed or deferred.

To augment the local funds for the execution and maintenance of public works, supplementary impositions were exacted from the urban residents. Street taxes were collected from property owners for street works, their upkeep, preservation, and illumination. Meanwhile, the clean and hygienic meat produced by the slaughterhouses were also taxed. As in many cases, these additional economic burdens became a point of conflict, resistance, and debate in the capital.

One of the central themes related to the public works construction and urban policies in Manila was the uneven development of the city´s urban spaces. However, this disparity was no longer between the *Intramuros* vis-à-vis *Extramuros* divide that once characterized the city in the early Spanish rule. In the previous centuries, the discourse revolved around the stringent colonizer-colonized dichotomies of Manila´s spatial and urban layout divide. However, this investigation demonstrated that a new urban

configuration emerged in Manila by the late eighteenth and nineteenth century. I argue that in the context of the planning and execution of public works, the city was visualized, planned, and engineered based on the two geographical spaces of the growing urban sprawl- first, the suburbs on the right bank of the river composed of Binondo, Tondo, Sta. Cruz, Quiapo, San Miguel, and Sampaloc; and second, the suburbs on the left bank which consisted of San Fernando de Dilao/Paco, Ermita, and Malate.

The pull of the burgeoning economic prospects outside the ¨Walled City¨ made the right bank of the Pasig river the capital´s ¨new center¨. The public works projects affirm this centrality of the suburbs. While Intramuros was still integral in the nineteenth-century network of infrastructures, the centrality of the districts of Binondo-Santa Cruz-Quiapo-San Miguel and later of Tondo and Sampaloc would manifest in the arteries of roads and streets, public lighting, and water pipelines that traversed through these zones. Aligned, widened, paved, cleaned, cleared, lighted streets did not stop in the walls of Intramuros. Chapter 4 demonstrated the envisioned arterial street networks that linked Binondo, Santa Cruz, Quiapo, and Sampaloc. This was also evident in the selection of the location of the city´s slaughterhouse, principal markets, and cemetery. For instance, the old slaughterhouse in Dulumbayan (in Santa Cruz) was once an ideal sight to distance the noxious trade of animal slaughter from the dense settlements and the ¨city¨, which only pertained at first to Intramuros. With the urbanization of the right bank of Manila, the new city slaughterhouse was erected on the less-dense left bank of the river, in the district of Arroceros. Meanwhile, La Loma general cemetery was built on the right bank of the river to service the adjacent flourishing districts as opposed to the old general cemetery of the city in Paco which was located on the left bank of the river. This saved the urban residents on the right bank from crossing the river so they could lay their loved ones to eternal rest in Paco´s sacred grounds.

The heterogeneity of the city´s arrabales characterized the city´s composition. Even Spanish peninsulars maintained second residences in the dynamic arrabales. The previous chapters showed the suburbs as melting pots of diverse racial and socio-economic groups. As settlements became porous, mixed, and cosmopolitan, the urban problems of insalubrity, congestion, contamination, and disorder became everybody´s business as they shared the same sights and smell of polluted waters, noxious areas, disordered public spaces, and unhygienic food spaces.

Inarguably, the modernizing and innovative structures of well-organized streets, illuminated thoroughfares, waterworks system, slaughterhouses and markets, and cemeteries ushered in improvements in public health, hygiene, security, and order. Wider and aligned roads meant easier mobility and passage. Well-ventilated, cleaned, and cleared streets and dwellings prevented the rapid spread of diseases. Lighted roads emitted security, order, and progress. Hydraulic infrastructures, which was a key indicator of modern societies, provided residents with safe drinking water. Slaughterhouses and markets ensured hygienic food supply. Cemeteries provided a decent place for the deceased while observing sanitary measures of dead disposal. This study demonstrated that the Spanish empire´s ideas of sanitation and hygiene, order, and social control were evidently incorporated in the conception, construction, and regulation of public works projects to solve the rising problems of congestion and pollution, rapid spread of diseases, and the challenge of controlling the urban populations.

Public works were important building blocks in the project of Manila´s city-making. The modernizing and innovative infrastructures played a transformative role in the making, unmaking, and remaking of the capital´s urban fabric. These infrastructure works aided in the legibility of the city leading to the identification of streets, linking of suburbs and communities, and the formation of a new urban layout of the capital. It is undeniable that despite its failures and limitations, Spanish rule was able to establish the beginnings of a ¨networked city¨ wherein attempts of linked and interrelated infrastructures were placed for the better delivery of urban services. In a sense, the waterworks project literally linked the city in pipes. This idea can also be said in the street networks. Arroceros slaughterhouse was closely linked with one of the principal markets of the city, the Quinta market in Quiapo. With La Loma´s construction, new roads and streets had to be opened for its access. The Spanish colonial government in Manila would explicitly use the public works and infrastructure projects as attempts to introduce reforms and transform the colony as they invoked images, representations, and ideologies of urban progress and modernity.

However, this study also clearly shows us that most of the time public works projects were marked by colonial impositions, unequal opportunities, and uneven access. The conception, planning, implementation, and regulations of these structures and their

associated spaces manifested the colonial mechanisms of domination and control; and consequently, were replete of narratives of contestations and negotiations from the different urban communities.

Displacement not only of individuals but of entire communities was an undeniable effect of urban spatial modifications and reorganizations. Most of the time, the needed public works projects necessitated the expropriation of property and even of the demolition of whole settlements all in the name of salubrity, public order and ornate, and modernity. For example, we saw the cases of the displacement of thousands of Tondo and San Nicolas residents as their narrow, irregular, and congested dwellings became urban threats for the city´s public health and security. For the urban reformers, this reorganization of the urban layout of San Nicolas and Tondo did not only mean the construction of hygienic and visually-pleasing thoroughfares. This reorganization was also part of making these territories more *legible, addressable,* and *governable.* The exodus of many of these residents to the then less-populated districts of Ermita, Malate, and Paco resulted to the densification of these areas in the long run. By the second half of the nineteenth century, the lands to the left bank of the Pasig river also began to demonstrate signs of densification and overcrowding. The concept of ¨ownership of private property¨ was reinforced as urban spaces were restructured. Natives became victims as they could not present proofs of ownership of the lands where thir homes stood. For the well-to-do class, this became an opportunity to assert their ownership and legal right to space as they challenged the government through formal complaints.

The use of public works was governed by specific rules that outlined not only the ¨proper¨ usage of the infrastructure but as well as the set of guidelines towards the attainment of the inhabitant´s disciplined attitudes and conduct. The public works projects did not only concern the public space per sé, as new discourses on ¨hygienic practices¨ and ¨healthy bodies and healthy cities¨ concerned the private body and intimate spaces of homes. For instance, new notions of public bathing, cooking and washing in public, and defecation were removed from the public gaze of the street and thoroughfares. With the advent of water and lighting, new conceptions of domestic salubrity and modernity were introduced to the urban tastes of the residents. The construction of modern cemeteries challenged the traditional ideas concerning death and burial. Food was categorized and inspected if they were safe for public health. These changing discourses and attitudes

towards urban space, sanitation, order and social control was, most of time, contrasting to the urban residents' mentality and practices. For instance, the modern concept of ¨cleared¨ street was distant from the local´s idea of the multiple functions of the street. The natives and Chinese used the street for passage, for relaxation, for socializing, for earning a living, and even for their domesticated animals. Clandestine butchering and clandestine burial were two expressions of these contestations.

Despite the legal and surveillance mechanisms established by the government, urban residents demonstrated in many ways by which they resisted, modified, or circumvented these rules. The countless laws, decrees, and regulations involving policing, inspection, and administration reflected the resistance and contestations on the ground. Indeed, changing the habits and mentalities of the people, needed more than just the transformation of the physical space. More importantly, it involved the conversion of mentalities and conceptions of people.

I argue, moreover, that the presence or absence of infrastructures generated a more active participation and engagement among Manila´s urban residents. In the case of late nineteenth-century Manila, we saw more ¨*ordinary*¨ residents slowly becoming part of the dialogue in the improvement of urban spaces. Soon, they themselves began complaining and demanding that solutions be made to the pressing urban problems. We saw this, for example, in their increasing articulation of grievances and complaints in the newspapers and official correspondences to local authorities of the city council as they pressed for better cemeteries, improved streets and thoroughfares, alternative sites for garbage dump, among others.

Furthermore, residents were introduced to new ways of consumption as urban services became increasingly commodified and commercialized. Water that flowed from public fountains was free. Later, the convenience of direct water access to private homes was integrated into the city´s hydraulic system. This changed how water was distributed, domesticated, and consumed by the urban residents. This could also be said on the burial services in the cemeteries. The construction of modern burial grounds introduced the idea of the parcelling of cemeteries to be sold to or rented by the people. However, these new modes of urban services consumption disenfranchised the poor urban residents with no economic means. The public works highlighted the unequal opportunities and unequal

access to urban services. The more affluent suburbs of Intramuros-Binondo-Sta. Cruz-Quiapo-San Miguel were better serviced than the poorer and peripheral areas of Sampaloc and Tondo or of Paco, Ermita, and Malate. The previous chapters showed how public works reinforced the integration or isolation of communities in Manila.

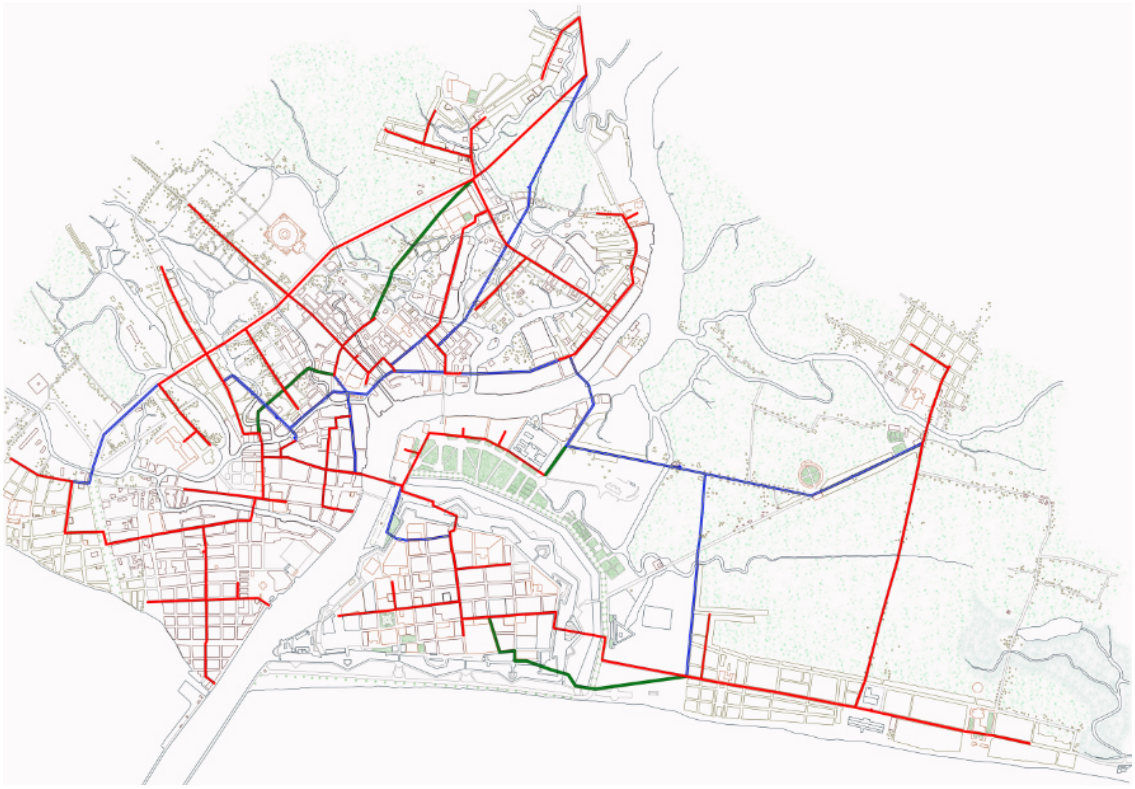

Figure 1: Manila´s network of water pipelines shown over the streets and districts of the city. These areas were also mostly the same illuminated areas of the city.
Source: Costelo, 2020.

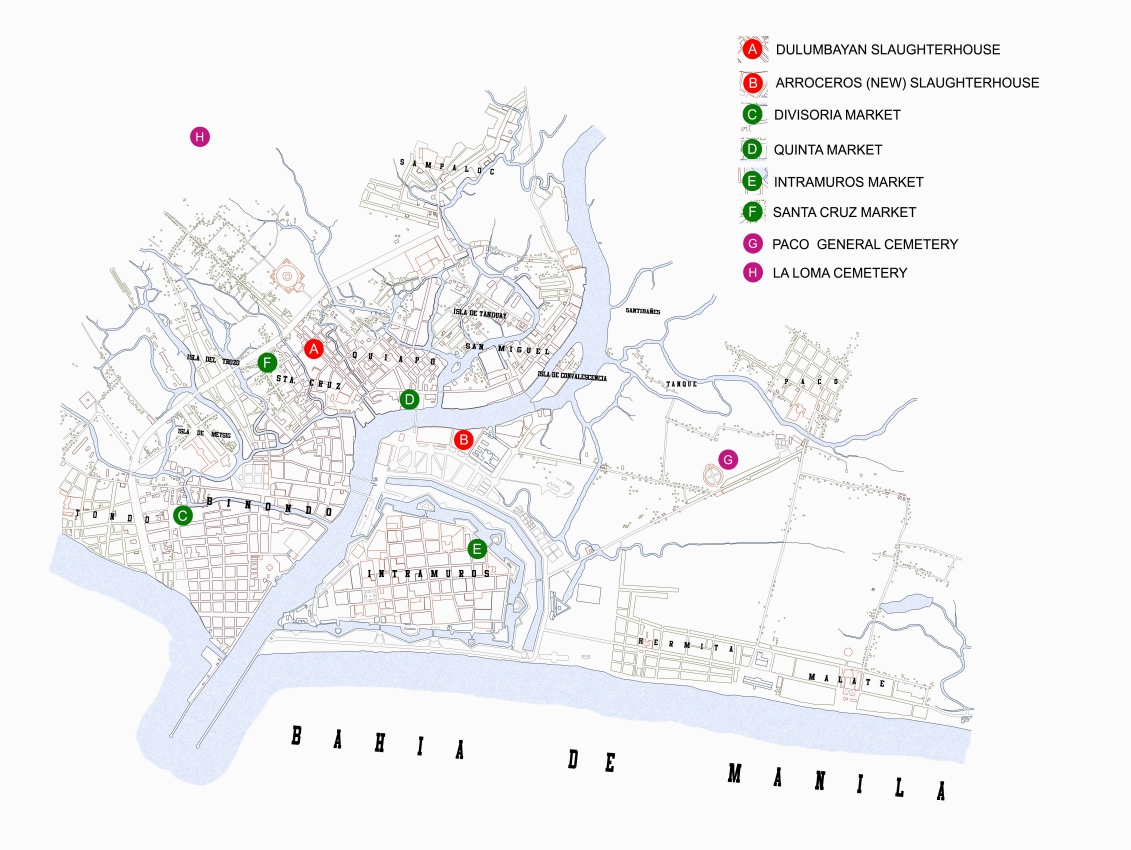

Figure 2: Location of the different slaughterhouses, markets, and cemeteries in Manila in the late eighteenth to the nineteenth century
Source: Costelo, 2020.

This current investigation hopes to contribute to the opening of an array of potential themes and topics that could be explored in the future. First, a further study connecting the last quarter of the nineteenth century to the early decades of the twentieth century is indispensable in the advancement of this field of investigation. This research has demonstrated that in the case of Manila, urban processes, transformations, and strategies went beyond the traditional ruptures of colonial empires. While this study chose to focus on the Spanish urban conceptions, policies, and undertakings in the late eighteenth to the nineteenth century, an examination of the American brand of urban design and organization is imperative. Archival sources lead us to believe that many, if not all, of the infrastructure projects and urban policies of the late nineteenth century were actually continued and expanded by the first decades of the twentieth century as shown in the concluding notes of Chapter 4 to 7. Linking, associating, comparing, and contrasting the two imperial visions and their praxis on the ground can broaden, deepen, and enrich our understanding of Manila´s urban growth and the innovations, breakdowns, and challenges that went through it. Through this approach, we can understand better the

continuities and discontinuities, the endurances and disruptions in the imperial views, designing of policies, and implementation of laws concerning urban space, public hygiene, and order.

Second, from a national perspective, this study opens and challenges researches on the experiences of other cities in the archipelago. Nineteenth-century forces also brought urban expansion and growth of other Philippine cities such as Cebu, Iloilo, Nueva Cáceres, etc.. In the previous chapters, we saw a short peek on how the central authorities in Manila attempted to replicate the urban and sanitary policies beyond the capital. If one will do a quick look and survey on the availability of materials, the AHN houses several documents on the late nineteenth-century public works undertakings in the different Philippine geographical areas. From here, we are challenged to see and analyze other models of urban growth beyond Manila. We ask for example, did the evolution of other provincial urban centers closely relate or deviate to that of Manila? What were the unique realities of these cities compared to the colonial capital?

Third, this study invites us to an exciting task of observing and contemplating beyond the archipelago and connect the urban processes of Manila to that of its neighbors in the Asian region. We saw in the public works projects the increasing transnational nature of these technological undertakings, thus, a bigger project of tracing the circulation and transfer of modern ideas and know-hows through the establishment of a techno-scientific network in the region involving the British colonies of Hong Kong and Singapore as well as the French Indo-China is a theme that can be explored in future studies. The documentation of the various actors and mediators involved in the construction of public works projects that moved beyond the confines of the empire´s borders could help us reimagine the confluences and convergences of the diverse communities in the region.

Lastly, this research reflects the existence of a wide variety of archival sources that scholars, Filipinos most especially, could utilize in order to present a more nuanced presentation of the story of Manila´s first intensive urban transformation. The sources show us how decisions were made, plans were envisioned, and urban structures and spaces were negotiated in colonial Manila.

Reimagining Manila´s urban expansion and growth is an effective exercise in tracing the roots of some of the city´s problems. We realize that the issues that Manila confronted centuries past *still* ring true until today. We longingly aspire for a city with well-ordered and hygienic districts and efficient, accessible, and integrated urban services. This investigation is a humble offering to my country as we continuously grapple with the trappings of modernization and modernity.

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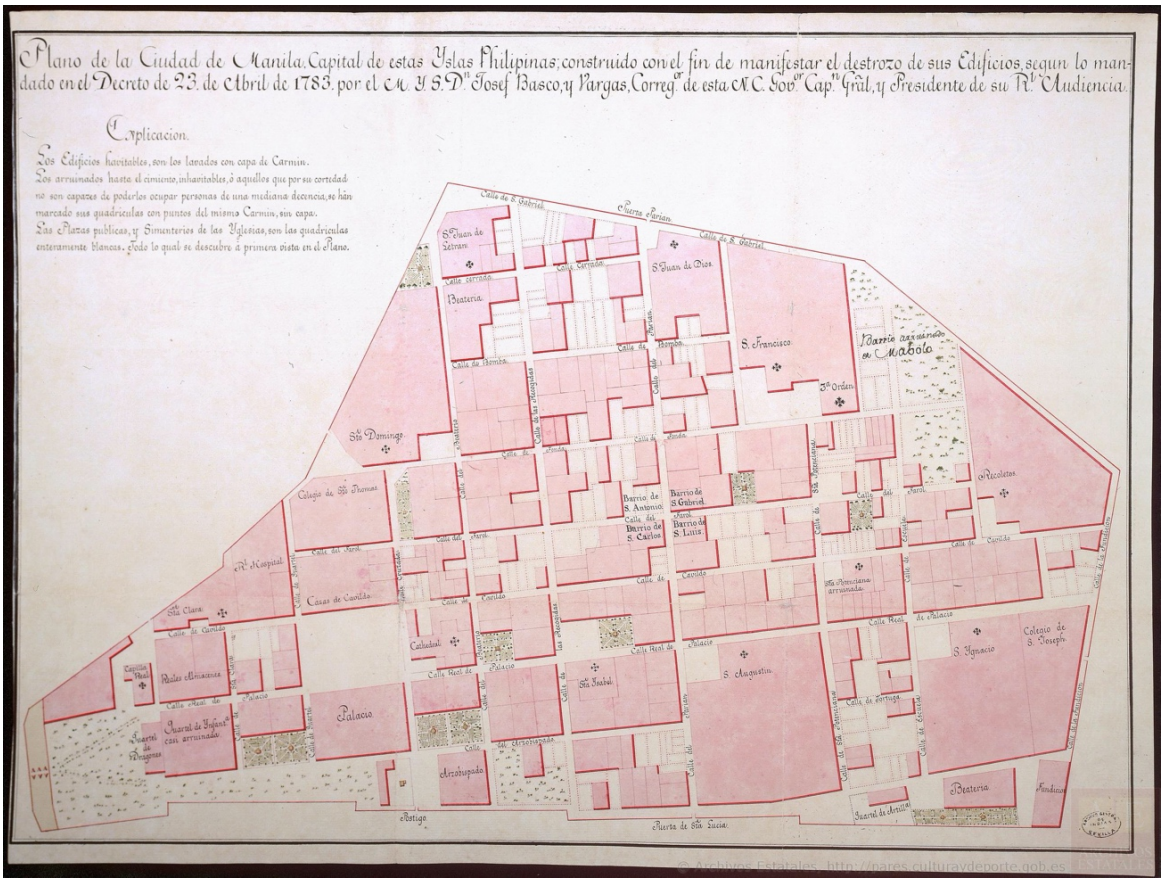
Appendix Chapter 1

A. Plan of Manila, 1783. (Note that in the last quarter of the eighteenth century, almost all streets of Intramuros were already named, documented, and cartographed. This could not be said in the case of the Extramuros.)

Source: AGI, MP-FILIPINAS, 229. Plano de la ciudad de Manila, capital de estas Yslas Philipinas, 1783.



B. 1920 Manila map showing the urban transformations from the late nineteenth century to the first decades of American rule

Source: US Coast and Geodetic Survey, 1920

C. Real Decreto de 19 de enero de 1894

1. La ciudad de Manila con los antiguos pueblos que han ido agregándosele y hoy forman sus arrabales de Tondo, Binondo, Trozo, Santa Cruz, Quiapo, Sampaloc, San Miguel, San Fernando de Dilao, Ermita, y Malate, constituíran un solo Municipio, dividido en 11 distritos, 10 correspondientes a las parroquias que hoy existen y el undécimo a la barriada de San Nicolas, hoy perteneciente a Binondo, comprendida entre el estero de este nombre y el mar.
   Todo lo relativo a alteraciones del término municipal de Manila, se acordará por el Ayuntamiento, con la aprobación del Gobernador General, y para la agregación o segregación de territorio o pueblos se oirá a la Dirección General de Administración Civil y Consejo de Administración-
2. El Ayuntamiento de Manila se compondrá: de un acalde, cinco conjecales natos, y diez y seis concejales electos.
3. Cada uno de los 11 distritos de Manila estará regido por un Concejal Teniente de Alcalde a la vez Inspector del Tribunal correspondiente. Estos tenientes de alcalde serán elegidos por el Ayuntamiento a pluralidad de votos entre concejales electos o natos. Su nombramiento será sometido a la aprobación del Gobernador general.
4. Los tribunales de distrito, así de naturales como de mestizos sangleyes, formarán parte del Ayuntamiento de Manila, con el carácter de subordinados y auxiliares en la parte de administración y hacienda municipal que les confiera el reglamento que, para la ejecución de este Decreto, dictará el Gobierno general, a propuesta del Ayuntamiento y con audiencia del Consejo de Administración.
   El Tribunal de sangleyes quedará bajo su actual constitución y dependencia de las Autoridades, sin intervención alguna en la administración municipal.
5. Toda la población nacional de Manila figurará en los padrones especiales de que trata el párrafo siguiente y en otro general. Aparte de los padrones especiales de cada Tribunal de distrito, el Ayuntamiento de Manila tendrá otro particular, comprensivo de los habitantes peninsulares y sus descendientes en cualquier grado excluidos de la organización de los dichos Tribunales de distrito.
   Los 16 concejales de nombramiento serán designados por el Gobernador general, que los elegirá entre las personas de mayor aptitud que vengan comprendidas en alguno de los mencionados padrones con cuatro años o más de antelación, sin tener incompatibilidad ni impedimento reglamentarios.
6. Los cinco concejales natos serán: el castellano de la Fuerza de Santiago, dos designados de su seno por el claustro universitario, uno por la cámara de comercio y uno por la Real Sociedad Económica de Amigos del País.
7. La renovación de los concejales de nombramiento se hará por terceras partes, al principio de cada año.
   El alcalde será nombrado por el Gobernador general, a propuesta del Ayuntamiento, a pluralidad de votos, designándolo entre los concejales.
   Ejercerá su cargo por tres años, salvo la facultad de separarlo que tendrá siempre el Gobernador general, aunque le correspondiera cesar en el de concejal. En este caso la vacante no será cubierta hasta que cese también en la Alcaldía.
8. Los asuntos económicos y administrativos privativos del Municipio de Manila serán resueltos por los Tribunales de distrito, el Ayuntamiento, el Alcalde y el Gobernador general, según los casos.

El reglamento señalará categóricamente las respectivas facultades de las dichas Corporaciones y Autoridades y los casos, plazos, y trámites de los recursos de alzada.

Corresponderá a la Dirección general de Administración Civil preparar las resoluciones del Gobernador General en los asuntos de quintas, Beneficencia e Instrucción Pública del Municipio de Manila.

También corresponderá a dicha Dirección inspeccionar constantemente los servicios de contabilidad municipal.

9. Al alcalde corresponderá dictar y publicar los bandos y exigir su cumplimiento, asi como el de los acuerdos de la Corporación sobre policía, ornato, urbanización, vigilancia y seguridad, con todas las facultades y preeminencias concedidas a los Corregidores de Manila en el Real decreto de creación de dicho cargo, que quedará separado del de Gobernador civil le corresponden.
10. El Ayuntamiento de Manila tendrá funciones y atribuciones análogas a las concedidas por la ley Municipal vigente en la Peninsula, cuyas disposiciones serán adaptadas a las de este decreto por el Gobierno general en el reglamento que se dicte para su ejecución, en la parte conveniente y aplicable.
11. El Ayuntamiento de Manila formará anualmente el presupuesto general de ingresos y gastos del Municipio, incluyendo en él los correspondientes a los Tribunales de distrito, siendo el alcalde el Ordenador de pagos.

    La aprobación de estos presupuestos, después de revisados e informados por la Dirección General de Administración Civil, corresponde al Gobernador General, que podrá oír al Consejo de Administración.

    El reglamento para la ejecución de este decreto contendrá las disposiciones de contabilidad, adaptando las que fuesen aplicables de los reglamentos vigentes en la Península y de los especiales del haber de los pueblos en vigor en el Archipiélago.
12. Para la aprobación de obras y establecimiento de industrias que afecten a la urbanización del término municipal o su viabilidad, se necesitará la aprobación del Gobierno general, que podrá según los casos, oír a la Junta Consultativa de Obras Públicas.
13. Además de los arbitrios y recursos consignados y autorizados para los otros pueblos en el Real decreto de 19 de mayo de 1893, el Ayuntamiento de Manila percibirá el 10 por 100 de los que recaude en la capital por el impuesto para las obras del puerto y establecimiento de faros, debiendo ser invertida dicha suma de un modo exclusivo en la conservación y mejora de las vías públicas y de los esteros que hoy tiene a su cargo la expresada Corporación.

    Para el establecimiento de nuevos arbitrios municipales, el Ayuntamiento oirá previamente, por conducto de los tenientes de Alcalde, a la principalías de los distritos, y votados que sean por la Corporación, serán elevados a la aprobación del Gobernador general de Administración Civil y del Consejo de Administración.

    Para la explotación de servicios municipales bastará el voto del Ayuntamiento y aprobación del Gobernador general.

Dado en Palacio a diez y nueve de enero de mil ochocientos noventa y cuatro.
MARIA CRISTINA

El Ministro de Ultramar
Antonio Maura y Montaner

Appendix Chapter 4

A. Instructions for the execution of new lay out of streets. (*Instrucción para la ejecución de los planos de* alineación). Published in Gaceta de Manila, 28 November 1867.

1. Los planos deben presentarse con claridad, exactitud, y precisión.
2. En todos ellos deben ponerse los nombres de las calles o plazas y las costas en escala métrica que exprese su ancho.
3. Todos los planos deben tener su orientación magnética y verdadera.
4. No deberá dejarse en blanco más que las calles, plazas o terrenos de aprovechamiento común.
5. Se trazarán con líneas negras los límites exteriores de todos los grupos de terreno cerrado o no, y en el cual existan o no edificaciones de la manera que se encuentran al levantar el plano, las cuales servirán también para marcar la situación de las calles en una disposición actual.
6. La escala para los planos de las alineaciones será de 1:300 y de 1:2000 para los generales de zonas de población.
7. Los cursos de agua aparente se dibujarán con tinta azul, y los cubiertos por bóvedas u obras de fábrica con líneas del mismo color, pero no llenas sino de puntos.
8. En el plano se marcará la línea de separación entre las diferentes propiedades.
9. En los proyectos se propondrán los nombres para las calles, plazas, paseos, y demás sitios que no los tengan sobre lo que resolverá el Gobierno Superior Civil.
10. Se señalarán especialmente las que sean travesías de carreteras o caminos expresando en las primeras el orden a que pertenecen y si están construidas o en proyecto o han de ejecutarse por hallarse comprendidas en plan general respectivo mandado ya formar.
11. A todo proyecto de alineaciones deberá acompañar el perfil longitudinal de la calle en la escala de dos milímetros por metro para las alturas, igualmente que perfiles transversales en los puntos más convenientes en la escala de cinco milímetros por metro.
12. Todos los proyectos de alineaciones deberán acompañarse con las modificaciones de las calles que lo requieran.
13. Lo serán igualmente de una memoria justificativa de las alineaciones propuestas indicando al principio de ella la forma, las dimensiones, la clase de empedrado, y el estado de viabilidad.
14. En todos los planos se trazarán las escalas con arreglo a las prescripciones anteriores.
15. La memoria deberá escribirse en papel común no continuo, del tamaño ordinario, dejando a ambos lados de cada página márgenes proporcionados. En la de la izquierda se indicará al lado de cada párrafo el objeto de que trata.
16. Todos los planos se sujetarán en tintas, signos, y demás accidentes al modelo adjunto.
17. Los planos se dibujarán en papel, tela, de un ancho igual a la menor dimensión de un pliego de papel ordinario, y con la longitud necesaria, plegándose de manera que quedan reducidos al tamaño de medio pliego, que es el que han de tener los demás documentos. Después de doblada cada hoja de plano al tamaño expresado, deberá escribirse en la cara que quede visible su título que designe claramente el número de orden de la hoja y lo que contenga

18. Todos los proyectos deberán remitirse por duplicado, firmado por el arquitecto municipal si lo hubiese o por el facultativo que lo reemplace y con el visto bueno del ingeniero jefe del distrito.

Decreto de 9 de julio de 1867. Aprobado por S.M.

B. List of arrested vagrants who were deported to Jolo and Paragua. 15 September 1877
*Sourc*e: AHN, ULTRAMAR, 5230, Exp. 40

Nombres	Pueblo de Empadronamiento	Estado	Edad
1. Andrés Montemayor	Binondo	Soltero	28
2. Ramón Gonzales	Binondo	Soltero	16
3. Lim- Pingco	Binondo	Viudo	22
4. León Hermógenes	Binondo	Soltero	35
5. Juan Legaspi	Binondo	Soltero	28
6. Simón Eleria	Binondo	Soltero	38
7. Chua Tangco	Binondo	Soltero	31
8. Dy-Checo	Binondo	Soltero	33
9. Celidanio Quilotan	Binondo	Casado	30
10. José Pelagio	Binondo	Soltero	32
11. Go Tiangco	Binondo	Soltero	24
12. Go-Chico	Binondo	Soltero	34
13. Lucio Crisóstomo	Caloocan	Soltero	21
14. Estevan África	Caloocan	Casado	40
15. Antonio Rivera	Ermita	Soltero	40
16. Román Adriao	Ermita	Casado	39
17. Doroteo Hermógenes	Ermita	Soltero	46
18. Pedro Juan Antique	Las Piñas	Casado	44
19. Dámaso Príncipe	Manila	Soltero	32
20. Lim-Co	Manila	Soltero	30
21. Eulalio Longson	Navotas	Soltero	24
22. Benito López	Navotas	Soltero	44
23. Mariano Díaz	Navotas	Soltero	28
24. Tomás Francisco	Novaliches	Casado	23
25. Juan Manuel	Parañaque	Soltero	50
26. Juan Lucio	Parañaque	Casado	30
27. Bonifacio Polintan	Pasig	Soltero	50
28. Evaristo Sto. Tomas	Pasig	Soltero	50
29. Domingo Banaag	Pasig	Soltero	44
30. Joaquín Fermín	Pasig	Casado	23
31. Anastasio Cervantes	Pineda	Casado	30
32. Antero Tolentino	Quiapo	Viudo	30
33. Catalino Mandolaza	Sta Cruz	Soltero	20
34. Te-Chaco	Sta Cruz	Soltero	30

35. Teodorico Máximo	Sta Cruz	Soltero	18
36. Pantaleón Gallardo	Sta Cruz	Soltero	19
37. Manuel Ricafor Santos	Sta Cruz	Soltero	24
38. Felipe Alcántara	San Miguel	Casado	36
39. Hermenegildo Aguinaldo	Taguig	Soltero	36
40. Juan Ramírez	Taguig	Casado	49
41. Pedro Nicolás Bilao	Taguig	Soltero	28
42. Eustaquio De La Cruz	Tambobo	Casado	35
43. Bonifacio Reyes	Tambobo	Soltero	31
44. Luis Mariano	Tambobo	Soltero	25
45. Liberato Florentino	Tambobo	Casado	44
46. Pedro Cristóbal	Tondo	Casado	48
47. Tiburcio García	Tondo	Soltero	21
48. Quirico Alvaran	Tondo	Soltero	24
49. Sy Picco	Tondo	Soltero	25
50. Juan Lansangan	Tondo	Viudo	34
51. Simón Antonio	Tondo	Soltero	27
52. Marcos de la Cruz	Tondo	Casado	22
53. Eustaquio San Pascual	Montalban	Soltero	36
54. Gregorio Villarea Alcántara	[No información, ¿¿indocumentado?]	Soltero	28
55. Exequiel Aguilar	[No información, ¿¿indocumentado?]	Soltero	
56. Ciriaco Calderón	[No información, ¿¿indocumentado?]	Soltero	
57. Guillermo Gestive	[No información, ¿indocumentado?]	Soltero	
58. Estevan Cacalda	[No información, ¿indocumentado?]	Soltero	
59. José Buenvenido	[No información, ¿indocumentado?]	Soltero	
60. Félix de la Cruz	[No información, ¿indocumentado?]	Soltero	
61. Macario Dorado	[No información, ¿indocumentado?]	Soltero	
62. Francisco San Juan	[No información, ¿indocumentado?]	Soltero	
63. Cipriano Casisian	[No información, ¿indocumentado?]	Casado	30
64. Francisco Tolentino	[No información, ¿indocumentado?]	Casado	
65. Macario Mairalastas	[No información, ¿indocumentado?]	Casado	
66. Patricio Cura	[No información, ¿indocumentado?]	Soltero	
67. Ambrosio Dizon	[No información, ¿indocumentado?]	Casado	
68. Alberto Miranda	[No información, ¿indocumentado?]	Casado	

69. Rufino Sanches	[No información, ¿indocumentado?]	Casado	
70. Estanislao Basco	[No información, ¿indocumentado?]	Casado	
71. Eulalio Antos	[No información, ¿indocumentado?]	Soltero	
72. Francisco Galang	[No información, ¿indocumentado?]	Casado	
73. Cristino Pantig	[No información, ¿indocumentado?]	Casado	
74. Francisco Manaloto	[No información, ¿indocumentado?]	Casado	
75. Simplicio Manalo	[No información, ¿indocumentado?]	Casado	
76. Eulalio David	[No información, ¿indocumentado?]	Soltero	
77. Narciso Linauig	[No información, ¿indocumentado?]	Soltero	
78. Gregorio Salvaga	[No información, ¿indocumentado?]	Soltero	
79. Francisco Calaquian	[No información, ¿indocumentado?]	Soltero	
80. Paulino Macaspac	[No información, ¿indocumentado?]	Soltero	
81. Nicolás Rojas	[No información, ¿indocumentado?]	Soltero	
82. Melencio David	[No información, ¿indocumentado?]	Soltero	
83. Gabino Mendoza	[No información, ¿indocumentado?]	Soltero	
84. Patricio Sungit	[No información, ¿indocumentado?]	Casado	
85. Felipe Dimacali	[No información, ¿indocumentado?]	Casado	
86. Lorenzo Libo	[No información, ¿indocumentado?]	Soltero	
87. Lorenzo López	[No información, ¿indocumentado?]	Soltero	
88. José Valderrama	[No información, ¿indocumentado?]	Casado	
89. Domingo Guevara	[No información, ¿indocumentado?]	Soltero	
90. Andrés Gambran	[No información, ¿indocumentado?]	Casado	
91. José Basi	[No información, ¿indocumentado?]	Casado	
92. Agatón Mendoza	[No información, ¿indocumentado?]	Casado	

93. Pedro Zapata	[No información, ¿indocumentado?]	Casado	
94. Juan de la Cruz	[No información, ¿indocumentado?]	Casado	
95. Juan Palo	[No información, ¿indocumentado?]	Soltero	
96. Fausto Rodríguez	[No información, ¿indocumentado?]	Casado	
97. Wenceslao Pecson	[No información, ¿indocumentado?]	Casado	
98. Anacleto de la Cruz	[No información, ¿indocumentado?]	Casado	
99. Bartolomé Dimacali	[No información, ¿indocumentado?]	Soltero	
100. Máximo Dimacali	[No información, ¿indocumentado?]	Soltero	
101. Severino Limpao	[No información, ¿indocumentado?]	Soltero	
102. Juan Terros	[No información, ¿indocumentado?]	Soltero	
103. Cayetano Naguet	[No información, ¿indocumentado?]	Casado	
104. Lázaro de Ocampo	[No información, ¿indocumentado?]	Casado	
105. Gregorio García	[No información, ¿indocumentado?]	Casado	
106. Catalino Isip	[No información, ¿indocumentado?]	Casado	
107. Ciriaco Mallari	[No información, ¿indocumentado?]	Viudo	
108. Gregorio Pinlac	[No información, ¿indocumentado?]	Casado	
109. Eugenio Viray	[No información, ¿indocumentado?]	Casado	
110. Juan Tuman	[No información, ¿indocumentado?]	Casado	
111. Ciriaco Viray	[No información, ¿indocumentado?]	Viudo	
112. Agapito Viray	[No información, ¿indocumentado?]	Soltero	
Mujeres			
1. Antonia Catajan	[No información, indocumentada?]	Soltera	18
2. Serapia Cuevas	[No información, indocumentada?]	Soltera	18
3. Agapita Gabriel	[No información, indocumentada?]	Soltera	16

4. Agapita Aguilar	[No información, indocumentada?]	Soltera	17
5. Aniceta Francisco	[No información, indocumentada?]	Soltera	20
6. Bartola de los Santos	[No información, indocumentada?]	Soltera	50
7. Cleta de la Cruz	[No información, indocumentada?]	Soltera	20
8. Epifania Antioquia	[No información, indocumentada?]	Soltera	18
9. Enrica Nicolás	[No información, indocumentada?]	Soltera	18
10. Feliciana Castillo	[No información, indocumentada?]	Soltera	18
11. Francisca Alcántara	[No información, indocumentada?]	Soltera	20
12. Fabiano de la Cruz	[No información, indocumentada?]	Soltera	40
13. Fortunata Francisco	[No información, indocumentada?]	Soltera	18
14. Rufina de Jesús	[No información, indocumentada?]	Soltera	14
15. Francisca Gregoria	[No información, indocumentada?]	Soltera	17
16. Francisca Masangcay	[No información, indocumentada?]	Soltera	23
17. Juana Maravillosa	[No información, indocumentada?]	Soltera	26
18. María Catajan	[No información, indocumentada?]	Soltera	20
19. Maximiana de los Santos	[No información, indocumentada?]	Soltera	25
20. Marcela de los Reys	[No información, indocumentada?]	Soltera	17
21. María de los Santos	[No información, indocumentada?]	Soltera	18
22. María Antonia	[No información, indocumentada?]	Soltera	14
23. Macaria Binuya	[No información, indocumentada?]	Soltera	20
24. María de la Cruz	[No información, indocumentada?]	Soltera	24
25. Paula de la Cruz	[No información, indocumentada?]	Soltera	22
26. Pilar de los Santos	[No información, indocumentada?]	Soltera	42
27. Remigia de los Santos	[No información, indocumentada?]	Soltera	20

28. Juana Galang	[No información, indocumentada?]	Soltera	16
29. Segunda Moral	[No información, indocumentada?]	Soltera	19
30. Teodora de los Reyes	[No información, indocumentada?]	Soltera	18
31. Victoriana Alonso	[No información, indocumentada?]	Soltera	25
32. Victoriana Macalili	[No información, indocumentada?]	Soltera	16
33. Catalina Trinidad	[No información, indocumentada?]	Soltera	17
34. Isabel Gómez	[No información, indocumentada?]	Soltera	33
35. Mora infiel	[No información, indocumentada?]	Soltera	25
Hombres			
1. Agapito de Asís	Navotas	Casado	42
2. Juan Lorenzo	Novaliches	Casado	38
3. Jorge Serrano	[No información, indocumentada?]	Soltero	34
4. Dalmacio Biglangaua	[No información, indocumentada?]	Viudo	47
5. Agustín de los Reys	[No información, indocumentada?]	Casado	30
6. Valeriano Mercado	Pandacan	Viudo	23
7. Reymundo Liran	Parañaque	Casado	50
8. Antero de los Santos	Pasig	Soltero	27
9. Bartolomé Buenavista	Pateros	Casado	34
10- Teodoro Marcelino	Pineda	Casado	46
11. Rafael Claudio	Sampaloc	Soltero	37
12. Esperidión de la Cruz	Sampaloc	Soltero	23
13. Casimiro Cruz	Sta Cruz	Casado	22
14. Luis Rivera	Sta Cruz	Casado	35
15. Pastor López	Sta Cruz	Soltero	15
16. Cándido del Espíritu	San Mateo	Casado	43
17. Rogerio de los Santos	Taguig	Casado	33
18. Nepomuceno Amado	Tondo	Soltero	40
19. Francisco Guevara	Tondo	Soltero	40
20. Yao-Yanco	Tondo	Soltero	35
21. Simplicio Gonzaga	Tondo	Soltero	24
22. Pedro Alonso	Trozo	Soltero	17
23. Lorenzo Alcaín	Tondo	Soltero	17
24. Hugo Alcober	Tondo	Soltero	30
25. Mariano Ynanat	Tondo	Casado	29
26. Segundo Lico San Juan	Tondo	Casado	31

27. Pablo José Cruz	Tondo	Casado	29
28. Fernando Congcong	Tondo	Casado	20
29. Casimiro Bandino	Tondo	Casado	20
30. Silverio Tamaya	Tondo	Casado	20
31. Cándido de los Santos	Tondo	Casado	20
32. Hipólito de los Reyes	Tondo	Casado	20
33. Elías Manaloto	Tondo	Casado	20
34. Nicolás Bondoc	Tondo	Casado	20
35. Isabelo Alfonso	Tondo	Casado	20
36. Francisco Tubig	Tondo	Casado	20
37. Felipe Pinlac	Tondo	Casado	20
38. Feliciano Sunga	Tondo	Soltero	20
Mujeres			
1. Nicolasa del Espíritu Santo	Tondo	Soltera	60
2. Plácida Javier	Tondo	Soltera	35
3. Alejandra Rivera	Tondo	Soltera	29
4. Basilia Quitalig	Tondo	Soltera	38
5. Escolástica de la Cruz	Tondo	Soltera	32
6. Macaria de la Cruz	Tondo	Soltera	30
7. Macaria Ygnacia	Tondo	Soltera	35
8. Simona Tagle	Tondo	Soltera	?
9. Estevana Veterana	Tondo	Soltera	24
10. Verónica Ramos	Tondo	Soltera	33

C. List of names of proprietors who paid the street lighting and cleaning tax, 1862-1863

Source: **AHN, Ultramar, 5191, Exp.14**

INTRAMUROS					
PROPIETARIOS O ADMINISTRADORES	NOMBRE DE LA CALLE	NÚMERO DE LA CASA	VARAS QUE MIDEN	PESOS (ALUMBRADO Y LIMPIEZA)	CENTIMOS
Don Pastor Diaz Arguelles	Arzobispo	3	72 1/4	27	09 3/8
Don Jose Ferratez		5	30	11	25
Don Jose Aguirre		4	41 ¾	16	03 1/8
El Excmo e Ilustrisimo Sor. Arzobispo		2	276	103	50
Sor. Provisor		4	28	10	50
Los P.P. de la Compañía de Jesús		6	107 ¾	40	40 5/8
Id._____ Id._____		8	82	30	75
M.R.P. Procurador de San Agustin		10	17 1/2	6	56 2/8
Id._____ Id._____		12	15 ½	5	81 2/8
Id._____ Id._____		14	10 ½	3	93 6/8
Id._____ Id._____		16	11 ½	4	31 2/8
Sr. Apoderado de Nsra. Señora de la Correa		18	8 ½	3	18 6/8
Id._____ Id._____		20	8 ½	3	18 6/8
Id._____ Id._____		22	8 ½	3	18 6/8
Id._____ Id._____		24	8 ½	3	18 6/8
Id._____ Id._____		26	34	12	75
			SUMA	285	65 5/8
Don Antonio Enriquez	Audiencia	2	29 ¾	11	15 5/8
Don Jose Varela		4	74 ¼	27	84 3/8
Don Antonio Maria Regidor		3	68	25	50
			SUMA	64	50
Doña Josefa Jurado	Anda	1	95	35	62 4/8
Don Juan José Zulueta		3	11 ¾	4	40 5/8
Sor. Provisor		5	29	10	87 4/8
Don Juan José Zulueta		7	52	19	50
Don Prudencio Laplana		9	21	7	87 4/8
Doña Carmen Salgado		13	14 ¾	5	53 1/8
Don Ignacio Ponce de Leon		15	28 ½	10	68 6/8
M.R.P. Prior de Sto Domingo		17	46 ¾	94	50
Id._____ Id._____		19	23 ¾	17	53 1/8
Id._____ Id._____		21	67	8	90 5/8
Sor. Apoderado de la Misericordia		2	272 2/3	25	12 4/8
Don José Iturralde		4	51 ½	102	25
Doña Agapita Iturralde		Pl. de Sta Isabel	51 ½	19	40 5/8
Doña Trinidad Celis		6	63 ½	23	81 2/8
Don Bernardino Lorenzo		8	22 ½	8	43 6/8
Doña Dominga Gil de Lopez		10	25 ½	9	56 2/8
Don Juan Jose Zulueta		12	49	18	37 4/8
La viuda de Don José Ma. Tuason		14	22 ½	8	43 6/8
Id._____ Id._____		16	31 ¼	11	71 7/8
Doña Josefa Ramos Fajardo		18	17 ½	6	56 2/8
Don Juan José Zulueta		20	22	8	25
Don Eduardo Luna		-	16 1/6	4	56 2/8
Don Juan José Zulueta		22	6 ½	2	43 6/8
Id._____ Id._____		24	10 ½	3	93 6/8
Don Alejandro Roces		26 y 28	15	5	62 4/8
Id._____ Id._____		30	17	6	37 4/8
			SUMA	405	21 7/8

Doña Potenciana de San Agustin	Beaterio	1	40 ½	15	18 6/8
Doña Joaquina Regiol		3	17	6	56 2/8
Don Juan Ignacio Ponce de Leon		5	12 ½	4	68 6/8
Id._____ Id._____		7	18 ½	6	93 6/8
Don Juan José Zulueta		9	64 ½	24	18 6/8
Don Ignacio Ponce de Leon		2	19 ½	7	21 7/8
Don Ramón Fernandez		4	21	7	87 4/8
Doña Narcisa Constantino		6	9 ½	3	56 2/8
Don Manuel Flores Grey		8	26 ¾	10	03 1/8
Don Manuel Castro		10	89 ½	33	56 2/8
Doña Antonia Verzosa		12	68	25	50
M.R.P. Presidente de San Juan de Letran		14	185 ¼	69	46 7/8
Id._____ Id._____		16	251 3/4	94	40 5/8
			SUMA	309	18 6/8
Sor. Don Tomas Balbas y Castro por Don Don Juan Andrade	Basco	1	21 ¾	8	15 5/8
Don Juan Roxas		3	10 ½	3	93 6/8
Don Francisco Pico		5	12 ¾	4	78 1/8
Sor. Don Tomas Balbas y Castro por Don Don Juan Andrade		-	17 ½	6	56 2/8
Doña Tomasa Legajet		2	10 2/3	4	03 1/8
Id._____ Id._____		4	5 ¾	2	15 5/8
Doña Maria Soto de Campo		6	6	2	25
M.R.P. Procurador de San Agustin		10	24 ¼	9	09 3/8
Id._____ Id._____		12	41	15	37 4/8
			SUMA	56	34 3/8
Don Joaquin Carrion	Baluarte	1	26	9	75
Don Antonio Enriquez		2	44 1/2	16	59 3/8
			SUMA	26	34 3/8
Don Clemente Lizola	Cabildo	1	15	5	62 4/8
Id._____ Id._____		-	12 ½	4	68 6/8
Id._____ Id._____		3	14 ½	5	43 6/8
Don Pedro Ocampo		5	14	5	25
Sor. Presidente de la Junta de Comercio		7	86	32	25
Sor. Provisor		9	15	5	62 4/8
Id._____ Id._____		11	13 ¾	4	40 5/8
Id._____ Id._____		13	10 ½	3	93 6/8
Id._____ Id._____		15	40	15	00
Don José Varela		17	56 ¾	21	28 1/8
La viuda de Don José Maria Tuason		19	9	3	37 4/8
Sor Provisor		21	13 ¼	4	96 7/8
Id._____ Id._____		23	13 ¾	5	15 5/8
Don Mariano Novales		-	12 ½	4	59 3/8
Don Vicente Gregorio Alberto		25 y 27	73 ¼	27	46 7/8
Don Rafael Crame		29	36	13	50
Don Francisco Pico		31	11	4	12 4/8
Doña Joaquina Regiol		33 y 35	19 ¾	7	40 5/8
Doña Josefa Ramos Fajardo		37	9 ¾	3	65 5/8
Sor. Provisor		39	13 ¾	4	15 5/8
Doña Lucia Martinez		41	11 ¾	4	40 5/8
Doña Josefa Ramos Fajardo		43	12	4	50
Don Lino Villareal		45	16	6	00
Doña Maria Soto de Campos		47	16	6	00
M.R.P. Procurador General de Recoletos		49	59	22	31 2/8
Don Julian Pardo		51	70 ¾	26	53 1/8
Don Carlos Calderon		53	32 ½	12	18 6/8
M.R.P. Procurador de San Agustin		4	52 ¾	19	78 1/8
Doña Trinidad Celis		6	19 ½	7	31 2/8

Don Jose de las Cagigas		8	11 ¾	4	40 5/8
M.R.P. Procurador de San Agustin		10	18	6	75
Id._____ Id._____		12	34 ¾	13	03 1/8
Don Casimiro Cortazar		14	70	26	25
Sor. Don Tomas Balbas y Castro		16	47 ¼	17	71 7/8
M.R.P. Procurador de San Agustin		18	17	6	37 4/8
Id._____ Id._____		20	51 2/3	19	37 4/8
Id._____ Id._____		22	61 2/3	23	12 4/8
Don José Gabriel Gonzales y Esquivel como curador de San Fandiño		24	14	5	25
Id._____ Id._____		26	13	4	87 4/8
Don Prudencio Laplana		28	22	8	25
Sor. Don Tomas Balbas y Castro		30	69 ¾	26	15 5/8
M.R.P. Procurador de San Agustin		32	53 ½	20	06 2/8
Doña Lucina Arroyo		34	18 ¼	6	84 3/8
Doña Maria Mesia		36	23 ½	8	81 2/8
Don Jose Gervacio Sierra		38	23 ½	8	81 2/8
M.R.P. Prior de los Recoletos		40	96 ¼	36	09 3/8
Id._____ Id._____		42	45 ½	17	06 2/8
Don Leandro Gruet		44	12	4	50
Don Manuel Araullo		46	14 ½	5	43 6/8
			SUMA	560	12 4/8
Dona Josefa Ramos Fajardo	Hospital	1	15	5	62 4/8
Don Mamerto Muñoz		3	9	3	37 4/8
Don José Carrillo		5	14	5	25
			SUMA	14	25
M.R.P. Procurador de San Agustin	Legaspi	3	37 ½	14	06 2/8
Doña Victoria Zaragoza		5	16 1/2	6	18 6/8
Don Gabriel Linart		7	15	5	62 4/8
Don Victor Blanco		9	21 ½	8	06 2/8
Doña Francisca Constantino		11	6 ¾	2	53 1/8
Don Exequiel del Rosario		13	6 ¼	2	34 3/8
Doña Joaquina Regiol		15	10	3	75
Doña Prudencia Cuyugan		17	11	4	12 4/8
Don Vicente Gregorio Alberto		19	17	6	37 4/8
Sor. Provisor		2	41 3/4	15	65 5/8
Id._____ Id._____		4	43 ¾	16	40 5/8
Don Valentin Mascaró por la menor de Ochoa		6	65 ¼	24	46 7/8
M.R.P. Prior de Sto. Domingo		8	21	7	87 4/8
Sor. Provisor		10	17	6	37 4/8
Doña Vicenta Saturnina Reyes		12	16	6	00
Don José Santos Rodriguez		14	17 ¾	6	65 5/8
M.R.P. Procurador de San Agustin		16	23 ¾	8	90 5/8
			SUMA	145	40 5/8
Don Manuel Ramirez	Magallanes	3	74 ½	27	93 6/8
M.R.P. Procurador de San Agustin		5 y 7	33 ¼	12	46 7/(
Don Juan José Zulueta		9	64 ½	24	18 6/8
M.R.P. Procurador de San Agustin		11	13	4	87 4/8
Don José Pascual Lugo		13	10	3	75
Don José Espiridion Rivera		15	10 ½	3	93 6/8
Doña Vicenta Jurado		17	10	3	75
Don Cecilio Recio		19	13	4	87 4/8
Don Tomas de Leon		21	11	4	12 4/8
Don Miguel Sanchez		23	18	6	75
Doña Tomasa Legajet		25	10	3	75
M.R.P. Procurador General de Sto. Domingo		27 y 29	67	25	12 4/8
Don Ramon Cadorniga		31	66	24	75

Doña Maria Tiongco		-	72 ½	27	18 6/8
M.R.P. Procurador de San Agustin		33	24	9	00
Don José Gabriel Gonzales y Esquivel como curador de San Fandiño		35	25	9	37 4/8
Don Ramon Cadorniga		37	24	9	00
Don José Gervacio Sierra		39	19	7	12 4/8
El Don Cura Parroco de Sta. Cruz		41	21 ¼	7	96 7/8
Don Lino Villareal		43	27 ¾	10	40 5/8
Don Miguel Sanchez		45	54	20	25
Don José Varela por su hermana Doña Maria		2	40 ¾	15	28 1/8
Don Mariano Sta Ana Marcial		4	15	5	62 4/8
Doña Eduviges Luna		6	21 ½	8	06 2/8
Don Juan José Zulueta		8	15 ½	5	81 2/8
La viuda de D. José Ma. Tuason		10	25 ¼	9	46 7/8
Doña Josefa López		12	14	5	25
Doña Josefa Jurado		14	17	6	37 4/8
Doña Josefa López		16	16	6	00
Don Juan Roxas		18	10	3	75
Doña Joaquina Regiol		20	9 ½	3	56 2/8
Sor. Provisor		22	26 ¼	9	84 3/8
Doña Maria Dolores Alberto Gomez		24	18 ½	6	93 6/8
M.R.P. Prior de Recoletos		26	19 ¾	7	40 5/8
M.R.P. Procurador de San Agustin		28	11 ¼	4	21 7/8
Doña Josefa Ramos Fajardo		30	11	4	12 4/8
M.R.P. Procurador de San Agustin		32	18	6	75
Id._____ Id._____		34	12 ¾	4	78 1/8
M.R.P. Prior de Recoletos		36	29 ½	11	06 2/8
Don José Infante		38	58	21	75
Don Juan Antonio Gómez		40	145	54	37 4/8
Don Hermogenes Dandan		42	27 ¾	8	15 5/8
Don Ramón Cadorniga		44	11 ¾	4	40 5/8
M.R.P. Procurador de San Agustin		46	14	5	25
			SUMA	468	84 3/8
Don Agustin Fernandez	Mercado	-	28	10	50
El D. Cura Parroco de Sta. Cruz		1	22	8	25
			SUMA	18	75
Don Ramon Gonzales	Muralla	1	56	21	00
Doña Antonia Tuason		2	15	5	62 4/8
Don José Guevarra		3	35 ½	13	31 2/8
			SUMA	39	93 6/8
Don Salvador Rubido	Palacio	3	183	68	62 4/8
Don Juan José Zulueta		5	105 3/4	39	65 5/8
M.R.P. Procurador de San Agustin		7	62	23	25
Id._____ Id._____		9	23	8	62 4/8
Id._____ Id._____		11	47 2/8	18	62 4/8
Id._____ Id._____		13	48 3/4	18	28 1/8
Id._____ Id._____		15	20 ¼	7	59 3/8
Id._____ Id._____		17	62 ½	24	93 6/8
Don José Ochia		25	25	9	37 4/8
Don Exequiel del Rosario		27	62	23	25
Don Ignacio de Ycaza		29	93 ½	35	06 2/8
Don Juan Gil y Montes		31	17	6	37 4/8
M.R.P. Procurador General de Recoletos		33	21 ¾	8	15 5/8
M.R.P. Procurador de San Agustin		35	27 3/4	10	40 5/8
Doña Maria Verzosa de Sunico		37	20	7	50
Don José Bustillos		39	67 ½	25	31 2/8
M.R.P. Procurador de Santo Domingo		41	84	31	50

Sor. Provisor		4 y 6	162 ½	60	93 6/8
Sr. Don José Ma. Tuason por Don Antonio Codorvin y Nieto		8	72	27	00
Don Juan Antonio de Aculle		10	29 ½	11	06 2/8
Don Antonio Enriquez		12	103 ½	38	81 2/8
M.R.P. Procurador de San Agustin		16	77 ½	29	06 2/8
Id._____ Id._____		18	76 ¼	28	59 3/8
Don Juan José Zulueta		20	15 ½	5	81 2/8
Don Joaquin Regiol		22	15	5	62 4/8
Don José Varela por su hermana Doña Maria		24	16 ¾	6	28 1/8
Sor. Provisor		-	256 ½	96	18 6/8
Don Vicente Arrieta	Plaza	1	50 ½	18	93 6/8
Doña Rafaela Gay		3	20	7	50
M.R.P. Prior de Sto. Domingo		5	64 ½	24	18 6/8
			SUMA	726	53 1/8
Don José arrieta	Fuerza Real	2	86 ½	32	43 6/8
Don Manuel Rodriguez		1	105 3/4	39	65 5/8
M.R.P. Procurador de San Agustin		3	68 ¼	25	59 3/8
Id._____ Id._____		5	24	9	00
La viuda de Don Tomás Quintana		7	77	28	87 4/8
Don Petronilo Melgarejo de Gonzales		9	10 ½	3	93 6/8
Id._____ Id._____		11	10	3	75
Don Jacobo Zobel		13	122	45	75
Don Ignacio Celis		15	34	12	75
Don Justo Reyes		17	10 ½	3	93 6/8
Don Mamerto Muñoz		19	18 ¼	6	84 3/8
M.R.P. Provincial de San Juan de Dios		21	21	7	87 4/8
Don José Calvo		23	43 ¼	16	21 7/8
Don Fernando Muñoz		25	44 ½	16	68 6/8
Id._____ Id._____		27	33	12	37 4/8
Doña Evaristo Javier		29	13 ½	5	06 2/8
Don Bernardo Sastre		31	38	14	34 3/8
Don Mariano Infante		33	51	19	12 4/8
Doña Romualda Cabrera		35	8 ½	3	18 6/8
Don Fernando Muñoz por su hermano Don Vicente		37	86 ½	32	43 6/8
Don Ignacio Celis		39	80	32	00
M.R.P. Procurador de San Agustin		2	673	252	37 4/8
Id._____ Id._____		4	23 ½	8	81 2/8
Sr. Don Tomas Balbas y Castro		6	74	27	75
Don Honorio Valenzuela		8	22 ¾	8	53 1/8
Don Leandro Gruet		10	43	16	12 4/8
Don Manuel Feroz Lonreiro		12	51 ½	19	31 2/8
Don José de Ycaza		14	21	7	87 4/8
Don José Varela por su hermana Doña Maria		16	47 ¾	17	90 5/8
Don Lorenzo Yparraguirre		18	16 ½	6	18 6/8
El albacea de Doña Maria Sergia Beltran		20	17	6	37 4/8
Don Ignacio de las Cagigas		22	15 ¼	5	71 7/8
			SUMA	714	37 4/8
M.R.P. Prior de los Recoletos	Solana	-	495	185	62 4/8
M.R.P. Prior de Sto. Domingo		1	367 3/4	137	90 5/8
Don Juan José Zulueta		3	77 ¼	28	96 7/8
Doña Narcisa Constantino		5	23	8	62 4/8
Doña Josefa Ramos Fajardo		7	17 ¾	6	65 5/8
Doña Pascuala Fernandez Blanco		9	49	18	37 4/8
Don Domingo Villaseñor		11	47	17	62 4/8
Sor. Provisor		13	14 ¼	5	34 3/8

Id._____ Id._____		15	10 ½	3	93 6/8
M.R.P. Procurador de San Agustin		17	12	4	50
Id._____ Id._____		19	13	4	87 4/8
Don Vicente Gregorio Alberto		21	23	8	62 4/8
Don Manuel Flores Grey		23	23 3/4	8	90 5/8
Don Bernardo Sastre		25	13 ½	5	06 2/8
Don Gabriel Linart		27	12 ½	4	68 6/8
Don Jorge Villoria por el Señor Huett		29	73	27	37 4/8
El apoderado de las Obras Pías		31	52	19	50
Id._____ Id._____		-	25	9	37 4/8
Don Eduardo Cabrera		33	17 ½	6	56 2/8
Doña Victoria Zaragoza		-	45	16	87 4/8
La Madre Priora del Beaterio de Sta. Rosa		2	151 2/3	56	87 4/8
Don José Arietta como curador de Doña Josefa Cia		4	68 ½	25	68 6/8
Don Pedro Tejada		6	20	7	50
Don Claudio Gutierrez		8	14 ¾	5	53 1/8
Don Ignacio Celis		10	24	9	00
Doña Juana Tovias		12	20 ½	7	68 6/8
Doña Teodorica Hernandez		14	13 ½	5	06 2/8
Don Catalino Villafranca		16	15	5	62 4/8
Sr. Sindico del Convento Hospitalario de Cavite		18	67 ½	25	31 2/8
Sor. Provisor		20	46 ¾	17	53 1/8
Don Eduardo Luna		22	16	6	00
M.R.P. Prior de Sto. Domingo		24	30	11	25
Don José Negrao		26	75	28	12 4/8
Don Pedro Infante		28	20 ½	7	68 6/8
Don Manuel Villa como albacea de Navea		30	8 5/6	3	31 2/8
Doña Maria Agripina		32	7 ¾	2	90 5/8
Doña Cristina Camposano		34	8 ¾	3	28 1/8
Don Mariano Novales		36	18 ¾	7	03 1/8
Don Bernardino Lorenzo		38	16	6	00
Don Bernardino Lorenzo		40	11 ½	4	31 2/8
Doña Mariana Aviles de Vierge		42	11 ¼	4	21 7/8
Doña Cristina Camposano		44	12	4	50
Don José Gervacio Sierra		46	33 1/4	12	46 7/8
			SUMA	610	65 5/8
M.R.P. Presidente de San Juan de Letran	San Juan de Letran	1	63 ½	23	81 2/8
Doña Matea Bañares		3	64 ½	24	18 6/8
Don Ramon Morillo		5	13 ½	5	06 2/8
M.R.P. Provincial de San Juan de Dios		7	14	5	25
Don Agustin Marco		9	14 ¾	5	53 1/8
Don Alejandro Roces		11	14	5	25
Doña Magdalena Alvarez de los Santos		13	10 ½	3	93 6/8
Id._____ Id._____		15	14 ¾	5	53 1/8
Doña Josefa Ker de Olloqui		17	46 ¾	17	53 1/8
Don Eduardo Luna		4	43 ¾	16	40 5/8
Don Eduardo Luna como curador de los menores de Luna		6	10 ½	3	93 6/8
Doña Ciriaca Tagle		8	18 ¼	4	96 7/8
M.R.P. Prior de Sto. Domingo		10	15 ½	5	81 2/8
Id._____ Id._____		12	16	6	00
Don Fernando Muñoz por su hermano Don Vicente		14	15	5	62 4/8
			SUMA	37	12 4/8
M.R.P. Prior de San Lazaro	San Francisco	1	16 ¼	6	09 3/8
Doña Isabel Otal de Goyenchea		3	51	19	12 4/8
			SUMA	25	21 7/8

Doña Josefa Bayot de Barcenas	Santa Potenciana	1	16	6	00
Don Francisco Farriol		3	41	15	37 4/8
Sor. Provisor		5	25 ½	9	56 2/8
Id._____ Id._____		7	21 ½	8	06 2/8
Don José Varela por su hermana Doña Maria		9	24	9	00
Don Bernardino Gonzales		4	11 ½	4	31 2/8
Sr. Don José Ma. Tuason por Don José Ferreras		6	22	8	25
Don Joaquin Carrion		8	10	3	75
Id._____ Id._____		10	7	2	62 4/8
Don José de las Cagigas		12	32	12	00
			SUMA	78	93 6/8
M.R.P. Procurador de San Agustin	San Agustin	2	63 ¾	23	90 5/8
Sor. Sindico del Convento Hospitalario de Cavite		4	12	4	50
M.R.P. Procurador de San Agustin		6	11 ½	4	31 2/8
Don Ramon Cadorniga		8	19 ¼	7	21 7/8
M.R.P. Procurador de San Agustin		10	10 ¼	3	84 3/8
Id._____ Id._____		12	50 ¼	18	84 3/8
M.R.P. Procurador de Santa Clara		14	44 ¼	16	59 3/8
M.R.P. Procurador de San Agustin		16	16	6	00
			SUMA	85	21 7/8
Sor. Provisor	San José	2	36	13	68 6/8
Id._____ Id._____		4	15	5	62 4/8
M.R.P. Prior de San Lazaro		6	15 1/2	5	81 2/8
Don Marcelino Salas		8	22	8	25
			SUMA	33	37 4/8
Doña Narcisa Constantino	Sto. Tomas	2	35 ½	13	31 2/8
Sor. Provisor		4	20 ½	7	68 6/8
Don Manuel Flores Grey		6	21 ½	8	06 2/8
M.R.P. Procurador de Sto. Tomas		5	272	102	00
			SUMA	131	06 2/8
Los P.P. de la Compañía de Jesús	Sta. Lucia	1	45	16	87 4/8
M.R.P. Procurador de San Agustin		3	17	6	37 4/8
Id._____ Id._____		5	13 ½	5	06 2/8
Don Agustin Marco		7	13 ¾	5	15 5/8
Don Feliciano Antonio		9	14 3/4	5	53 1/8
M.R.P. Procurador de San Agustin		13	16	6	00
Id._____ Id._____		15	9 ¼	3	46 7/8
Id._____ Id._____		17	9 ½	3	56 2/8
Id._____ Id._____		19	36 ½	13	68 6/8
			SUMA	65	71 7/8
Doña Atanacia de la Rosa	Victoria	1	56	21	00
Sor. Don Tomas Balbas y Castri por el testamento de Don Juan Andrade		3	53 ¾	20	15 5/8
Don Pedro Ocampo		5	19 ½	7	31 2/8
Don José Gabriel Gonzales y Esquivel como curador de San Fandino		7	14 ½	5	43 6/8
M.R.P. Prior de Sto. Domingo		-	36 ½	13	75
M.R.P. Provincial de San Juan de Dios		-	65	24	37 4/8
M.R.P. Prior de San Lazaro		9	12 ¼	4	59 3/8
Don José Crame		11	10	3	75
Sor. Provisor		13	10 ¾	4	03 1/8
Id._____ Id._____		15	10 ½	3	93 6/8
Doña Vicenta Saturnina Reyes		17	14 ¼	5	34 3/8
Don Feliciano Antonio		21	13 ¾	5	15 5/8
M.R.P. Prior de Recoletos		2	59	22	12 4/8
Don Nicasio Suarez Llanos		4	86 ½	32	43 6/8
Don José Gervacio Sierra		6	38 2/3	14	50

Doña Petrona Vallesteros		-	11	4	12 4/8
Id._____ Id._____		8	34 ¼	12	84 3/8
M.R.P. Prior de Recoletos		-	289 ¼	108	46 7/8
Doña Juana Tovias		-	80 ¾	30	28 1/8
Doña Magdalena Alvarez de los Santos		-	33 1/4	12	46 7/8
			SUMA	356	09 3/8
BINONDO					
PROPIETARIOS O ADMINISTRADORES	NOMBRE DE LA CALLE	NÚMERO DE CASA	VARAS QUE MIDEN	PESOS (ALUMBRADO Y LIMPIEZA)	CÉNTIMOS
Dª Maria Romana Bernardo	Anluage	1	36 1/2	13	68 6/8
Dª Maria Versosa de Sunico		2	59 2/4	22	40 5/8
D. Juan García Badon		3	19	7	12 4/8
D. Jose Corrales		3	34	12	75
D. Manuel Azcarraga		4	61	22	87 4/8
D. Teodoro Revilla para Dª Isabel Alberto		5	14	5	25
Dª Ana Mauricio		6	13	4	87 4/8
D. Teodoro Revilla para D. Lorenzo Alberto		7	15 1/2	5	81 2/8
Id._____ Id._____		8	37	13	87 4/8
D. Jose Luis de Tinciburo		9	23	8	62 4/8
D. Santos Modesto		10	16 1/2	6	18 6/8
D. Juan García Baden		11	46 1/2	17	43 6/8
D. Juan Faustino Cruz		12	13 1/2	5	6 2/8
D. Anastacio de Guzman		39	15 1/2	5	81 2/8
D. Alejo Feliz		40	9 1/2	3	50
D. Juan Faustino Cruz		41	28 1/2	10	68 6/8
Id._____ Id._____		41	11	4	12 4/8
D. Manuel Araullo		42	27 1/2	10	31 2/8
Los Hijos de Capitan Paterno		43	51 3/4	19	40 5/8
D. Evaristo Moreno		44	23 1/2	8	81 2/8
D. Balbino Mauricio		45	28	10	50
Dª Maria Somes de Butler		46	33	12	37 4/8
D. Pedro Tejada		47	97	36	37 4/8
D. Manuel Genato como Albacea de los Florentinos		47	79	29	62 4/8
Id._____ Id._____		48	10	3	75
D. Manuel Tuason		49	8 2/4	3	28 1/8
Dª. Maria Versosa de Sunico		50	11 1/2	4	31 2/8
Dª Juana de Dios Cruz de Irun		51	38 1/2	14	43 6/8
D. Ignacio Ponce de Leon		52	17	6	37 4/8
Dª Luisa Lopez		53	6 1/3	2	37 4/8
D. Manuel Genato como albacea de los Florentinos		54	16	6	00
			SUMA	338	03 1/8
Don Francisco Olea	Barraca	1	49 2/8	18	50
Don Wenceslao Torres		2	50	18	75
Don José Gonzales y Castro		3	23 1/3	8	87 4/8
Id._____ Id._____		4	17	6	37 4/8
Don Ceferino Joven		5	20	7	50
Los Señores Fernandez de Castro y Ca.		6	19 ¼	7	21 7/8
Don José Crame		-	67 1/2	25	31 2/8
Sor. Don Prudencio de Santos		-	217 172	81	56 2/8
Don Bartolome Antonio Baretto		7	14 1/3	5	37 4/8
Sor. Don Tomas Balbas y Castro		8	22 ½	8	43 6/8
Id._____ Id._____		-	128 ½	48	18 6/8
Don Vicente Vales		9	40 ½	15	18 6/8
Doña Dominga Oligario		-	13 5/6	5	18 6/8

Doña Dominga Oligario		-	22 5/6	8	56 2/8
Los Señores Roxas Hijos		11	108 ½	40	68 6/8
Don José Gabriel Gonzales y Esquivel		12	52	19	50
Id._____ Id._____		13	49 ¼	18	46 7/8
Don Narciso Padilla		14	48 2/3	18	25
Don Manuel de Azcarraga		14	33	12	37 4/8
Don Manuel Blanco		14	31	11	62 4/8
Don Ceferino Joven		14	8 ½	3	18 6/8
Don José Vales		15	9 ¼	3	46 7/8
Doña Lucia Pineda		16	5 ½	2	06 2/8
Doña Cecila Leyba		17	6 ½	2	43 6/8
Don Genaro Raymundo		18	16	6	00
Don José Ochoa		19	22	8	25
La viuda de Don José Maria Tuason		20	13	4	87 4/8
			SUMA	416	21 7/8
Don Bartolome Antonio Barretto	Anden de la Barraca	-	37 2/3	14	12 4/8
Id._____ Id._____		-	14 3/4	5	53 1/8
			SUMA	19	65 5/8
Don Henorio Ventura	Caballero	-	33	12	37 4/8
M.R.P. Prior de Sto. Domingo		-	15 ¼	5	71 7/8
D. Balbino Arevalo		-	14	5	25
Doña Placida Rojo		-	9 1/3	3	50
Doña Josefa Roxas de la Concha		-	13 ½	5	06 2/8
Don Domingo Ducepec		-	25	9	37 4/8
			SUMA	41	28 1/8
Don Jorge Villoria por el Sor. Huett	Carenero	1	26	9	75
Don Francisco de Paila Cembrano		2	119 1/4	44	71 7/8
			SUMA	54	46 7/8
Don Narciso Padilla	David	1	35	13	12 4/8
Los Señores Rocha y Ycaza		2	99 1/3	37	25
Don Francisco de Paula Cembrano por Don Lorenzo Margate		3	57 ½	21	56 2/8
Don Lorenzo Yparraguirre		4	15	5	62 4/8
M.R.P. Provincial de San Juan de Dios		5	5	1	87 4/8
Don Francisco Torrentegui		6	24	9	00
Id._____ Id._____		7	9 2/3	3	62 4/8
Don Juan Evangelista Veloso		8	23 ¾	8	90 5/8
Doña Maria de Ocampo		9	12	4	50
Id._____ Id._____		10	17 5/6	6	68 6/8
Id._____ Id._____		Jardin	12 ¾	4	78 1/8
Don Ramon Maurente		Jardin	36 3/4	13	78 1/8
			SUMA	130	71 7/8
D. Juan Reyes	Escolta	1	37	13	37 4/8
D. Jorge Villoria por el Sr. Hutu		2	26 1/2	9	93 6/8
Los Hijos de D. Pablo Tuason		3	48	18	00
D. Jose Luis de Aniciburo		4	24	9	00
D. Manuel Flores Gvey		4	24	9	00
D. Jose Luis de Aniciburo		5	30	11	25
Los Herederos de D. Feliz Gonzales		6	36	13	50
D. Pedro Tejada		7	79 3/4	29	90 5/8
Dª Cirica de los Santos		8	81	30	37 4/8
Id._____ Id._____		9	25	9	37 4/8
D. Manuel Somes		10	19 1/2	7	31 2/8
D. Juan Francisco Lecaros		11	68 1/2	25	68 6/8
D. Valentin Mascaro para la menor de Ochoa		12	67	25	12 4/8
Sor. D. Jose Mª tUASON		13	105 1/2	39	56 2/8
D. Bartolome Antonio Barretto		14	77	28	87 4/8

Sr. D. Jose Mª Tuason		15	35	13	12 4/8
Sor. Provisor		16	15	5	62 4/8
Dª. Ciriaca de los Santos		17	7 1/2	2	75
Sr. D. Jose Mª Tuason para D. Ramon OFarrell		18	39 1/2	14	81 2/8
D. Feliz Pardo		19	13 1/3	5	00
Dª Magdalena Alvarez de los Santos		20	10	3	75
D. Feliz Pardo		21	30	11	25
D. Mariano Flaherti		22	4 1/4	1	59 2/8
D. Feliz Pardo		23	4 1/4	1	59 378
D. Jose Gabriel Gonzales y Esquivel		24 y 25	18 1/2	6	93 6/8
Dª Ciriaca de los Santos		26	10	3	75
Id._____ Id._____		27	17	6	37 4/8
Dª Isabel Alberto de Sanchez		28	16 1/3	6	12 4/8
D. Jose Gabriel Gonzales y Esquivel		29	14 2/3	5	50
Sr. D. Tomas y Castro para D. Antonio Uzurruzaga		30	65 2/3	24	62 4/8
Los Señores Roxas Hijos		31	61 2/3	23	12 4/8
D. Narciso Padilla		32	16	6	00
Dª Maria Somes de Butler		33	75 3/4	28	40 5/8
D. Manuel Azcarraga		34	111 1/6	41	68 6/8
D. Manuel Aldaguer		35	22	8	25
			SUMA	501	06 2/8
Don Dalmacio Oligario	Ilang-ilang	2	14 ½	5	43 6/8
Don Apolonio Conchu		3	10 ½	3	93 6/8
Doña Josefa Gutiao		4	20 1/3	7	62 4/8
Doña Rita Esguerra		-	12 ¼	4	59 3/8
Don Mateo Bautista		-	13	4	87 4/8
Doña Felipa Feliciano		-	8	3	00
Don Dalmacio Oligario		-	12	4	50
Don Prudencio Laplana		-	20 1/3	7	62 4/8
Doña Juana Tanayco		-	16	6	00
Id._____ Id._____		-	15 ½	5	81 2/8
Antonio Paonca		-	11 ¼	4	21 7/8
Genaro Raymundo		-	12	4	50
			SUMA	62	12 4/8
Doña Josefa Gutiao	Jaboneros	4	26 2/3	10	00
Don Feliciano Antonio		5	10 ¼	3	84 3/8
Doña Maria de los Santos		6	7 ¼	2	71 7/8
Id._____ Id._____		7	12 ¾	4	78 1/8
Doña Luisa Cang		8	27 ¾	10	40 5/8
Doña Tomasa Laochangco		9	11	4	12 4/8
Don Domingo Ducepec		10	7	2	62 4/8
Doña Marina de los Santos		11	8 2/3	3	25
Doña Cornelia Laochangco		-	31	11	62 4/8
Don Macario de los Reyes		-	38 2/3	14	50
Doña Cornelia Laochangco		-	9 ½	3	56 2/8
Don Genaro Raymundo		-	6 1/3	2	37 4/8
Don Vicente Gregorio Alberto		-	30	11	25
Don José Ma. Baza		-	37 1/6	13	93 6/8
Id._____ Id._____		-	8 1/3	3	12 4/8
Don Apolonio Concha		12	14	5	25
Don Dalmacio Oligario		13	9 2/3	3	62 4/8
Don Fernando Mora		-	39 1/3	14	75
El Chino luna		-	9 ½	3	56 4/8
Doña Aristona Macaria		-	13 1/3	5	12 4/8
Don Macario Ly Tonjuna		-	20 2/3	7	75
Don Ceferino Joven		-	20	7	50

Doña Deogracias Morante		-	14 2/3	5	50
Don Juan Nicolas		-	26 ½	9	93 6/8
Don Antonio Padilla		14	33 ¾	12	65 5/8
Don Honorio Valenzuela		15	59 ¼	22	21 7/8
Don José Aruedo dela Cruz		-	9 2/3	3	62 4/8
Don Balbino Mauricio		-	22	8	25
Id._____ Id._____		16	19	7	12 4/8
Id._____ Id._____		17	7	2	62 4/8
Don José Aruedo de la Cruz		18	12 ¾	4	78 1/8
Don Balbino Mauricio		.	9 ¼	3	46 7/8
Don José Aruedo de la Cruz		19	40	15	00
M.R.P. Prior de Sto. Domingo		20	67 1/3	25	25
Don Eduardo Resurrección Hidalgo		-	45 2/3	17	12 4/8
Don Balbino Mauricio		-	6 1/3	2	37 4/8
Id._____ Id._____		21	6	2	25
Don José Florencio Rodriguez		22	26	9	75
Don Mariano OFarrell		23	15	5	62 4/8
Don Vicente Vales		25	30	11	25
Don Cristobal Triviño		26	21	7	87 4/8
Don José Nicolas Molina		-	5 2/3	2	12 4/8
Don José Florencio Rodriguez		27	10 2/3	4	00
Don Vicente Arcinas		28	4 ½	1	68 6/8
Don Vicente Gregorio Alberto		30 y 31	47 1/3	17	71 7/8
Doña Anselma Marifoque		29	13 ½	5	06 2/8
Dª Eulogia de Leon		32	13	4	87 4/8
D. Honorio Valenzuela		33	8 1/2	3	18 6/8
Dª Pantaleona Calixto		2	17 11712	6	71 7/8
Dª Valentin Mascaro para la menor de Ochoa		34	27 1/2	10	31 2/8
D. Manuel Jimenez		35	62 4/8	23	53 1/8
Los Hijos de D. Pablo Tuason		36	30 1/2	11	43 6/8
Dª Juliana Robledo		37	29 2/3	11	12 4/8
Dª Margarita Roxas		37	4	1	50
Dª Ignacia Eusevia		39	12 1/4	4	59 3/8
D. Manuel Genato como albacea de los Florentinos		40	8 1/2	3	18 6/8
Id._____ Id._____		41	29 2/8	11	12 4/8
D. Vicente Gregorio Alberto		42	23	8	62 4/8
Id._____ Id._____		43	36 1/3	13	62 4/8
Id._____ Id._____		44	12 2/4	4	78 1/8
D. Mariano Cesilio		45	10	3	75
D. Vicente Gregorio Alberto		46	14	5	25
D. Jose Luis de Tinciburo		R	17	6	37 4/8
Dª Cornelia Laochangco		S	23 1/3	8	75
D. Teodorico Santoja		47	20 3/4	7	78 1/8
D. Vicente Gregorio Alverto		48	10 1/3	3	87 4/8
Dª Calixta Javier de Somes		49	4	1	50
Dª Luisa Cang		50	4	1	50
Dª Josefa Lopez		51	15	5	62 4/8
D. Vicente Gregorio Alberto		52	14 5/6	5	56 2/8
Dª Guillerma Esguerra		53	11 2/3	4	37 4/8
D. Apolonio Conchu		54	7 1/2	2	81 2/8
Dª Isabel Herrera		55	8 1/2	3	18 6/8
D. Roman Ignacio		U	17 2/3	6	62 4/8
D. Eulalio de la Cruz		V	16 1/2	6	12 4/8
Los Hijos de D. Pablo Tuason		56	9	3	37 4/8
Dª Marcela Ferrer		P	18 1/4	6	84 3/8
Id._____ Id._____		57	23	8	62 4/8

			SUMA	567	53 1/8
D. Jose Mª Fabie y Gutierrez como albacea de su padre	Jolo	12	22	8	25
D. Jose Aguirre		13	25	7	50
D. Vicente Gregorio Alberto		14	20	7	50
D. Vicente Roxas		15	13	4	87 4/8
Dª Josefa Roxas de la Concha		16	16	6	00
Dª Ana Mauricio		16	18	6	75
D. Alejandro Roces		16	18	6	75
D. Leocadio Ramirez		16	19 1/3	7	25
D. Alejandro Roces			33 2/3	12	62 4/8
D. Francisco Mortera		16	17 1/3	6	50
D. Manuel Rodriguez		17, 18, 19	73	27	37 4/8
D. Jose Gomez			41	15	37 4/8
Dª Monica Lopez			13 3/4	5	15 5/8
D. Vicente Vales			14	5	25
Id._____ Id._____			8	3	00
D. Dalmacio Oligario			31	11	62 4/8
Dª Vicenta Roxas			33 1/3	12	50
D. Jose Vasquez			21	7	87 4/8
D. Geronimo de Ocampo			14 2/3	5	50
D. Jose Nicolas Molina			10 1/2	3	93 6/8
Id._____ Id._____			10 1/3	3	87 4/8
Id._____ Id._____			10 1/3	3	87 4/8
Id._____ Id._____			14 1/3	5	5 37 4/8
D. Jose Infante			46 374	17	53 1/8
D. Modesto de Castro			11	4	00
D. Jose Corrales			29	10	87 4/8
El Chino Mariano			10 2/3	4	00
D. Manuel Pereyra			20 1/4	7	59 3/8
Sr. Don Jose Mª Tuason			47	17	62 4/8
d! Verancia de Guzman		22	27	10	12 4/8
D. Doroteo Martín de Angeles		23	22 1/2	8	43 6/8
Sor. Herman		24	6 1/4	2	34 3/8
D. Miguel Wenceslao Soriano		25	16 1/2	6	18 6/8
Id._____ Id._____		26	31 172	11	81 2/8
D. Juan Veloso Evangelista		27	29 1/2	10	96 7/8
D. Miguel Wencelaso Soriano		28	43 1/2	16	31 2/8
D. Tomas Fuentes		29	10 1/2	3	93 6/8
D. Francisco Roxas		30	13	4	87 4/8
D. Alejo Feliz		31	10 1/4	3	84 3/8
Dª Monica Lopez		32	6 1/2	2	43 6/8
Dª Cesarea Acuña		33	6 2/3	2	50
D. Francisco Roxas		34	18	6	75
D. Miguel Wenceslao Soriano		35	14 3/4	5	53 1/8
D. Roman Ignacio		36	15 1/2	5	81 2/8
D. Telesforo Feliz		37	13 1/2	5	6 2/8
			SUMA	355	28 1/8
Don Manuel Pereyra	Callejon de Pereira	1	9 ½	3	56 2/8
Id._____ Id._____		3	12 ½	4	68 6/8
Id._____ Id._____		5	12	4	50
Doña Monica López		7	11	4	12 4/8
Don Manuel Pereyra		9	12	4	50

Don José Gervacio Sierra		4	22	6	25
Don José Vasquez		-	17 2/3	8	62 4/8
Don Antonio Enriquez		-	34	12	75
			SUMA	49	00
Don Manuel Callejas	Longos	-	18 2/3	7	00
Don José de los Rios		-	10	3	75
Don Eustaquio de Leon		-	38	14	25
Don Victorio de los Reyes		-	15 2/3	5	87 4/8
Don Bernabe Bustamante		-	38 ½	14	43 6/8
Don Ramon Orive		-	49 2/3	18	62 4/8
Don Justiniano Zamora		-	12 2/3	4	75
Don Ramon Orive		-	17 1/3	6	50
Don Reducindo Ocampo		--	13	4	87 4/8
Don José Vales		-	41	15	25
Doña María Epitacia de los Reyes		-	17 ¾	6	65 6/8
Doña Potenciana de la Cruz		-	46 ½	17	43 6/8
Don Telesforo Feliz		-	25 2/3	9	62 4/8
Don Teodoro de San Mateo		-	16	6	00
			SUMA	135	03 1/8
Don Teodoro de Jesus	Murallon	-	40 2/3	15	25
Don Eduardo Resurrección e Hidalgo		-	91 278	34	37 4/8
Id._____ Id._____		-	85 2/3	32	12 4/8
Id._____ Id._____		-	36	13	50
			SUMA	95	25
Doña Rafaela Gay	Nueva	3	12	4	50
Don Teodoro Revilla por Doña Maria Leyba		5	14 ¼	5	34 3/8
Doña Maria Lomes de Butler		7	10	3	75
Doña Lucina Arroyo		9	12 2/8	4	75
Doña Paulina Roxas		11	13 3/4	4	96 7/8
Don Francisco de los Reyes		13	13 ¼	4	96 7/8
Id._____ Id._____		15	16	6	00
Id._____ Id._____		17	38 ½	14	43 6/8
Don José Maria Bza		19	47 1/4	17	71 7/8
Don Florentin Javier		21	15	5	62 4/8
Don José Aguirre		23	17	6	37 4/8
Doña Vicenta Roxas		25	11	4	12 4/(
Id._____ Id._____		27	17 ½	6	56 2/8
Don Ignacio de Ycaza		1 hasta el 11	49 ¾	18	65 5/8
Don Pedro Gil		35	13 ½	5	06 2/8
Sor. Don José Ma. Tuason		37	13	4	87 4/8
Id._____ Id._____		39	53	19	87 4/8
Don Valentin Mascaró		41	18 ¼	6	84 3/8
Don Vicente Gregorio Alberto		43	13 ½	5	06 2/8
Id._____ Id._____		45	55	20	62 4/8
Doña Marina de los Santos		47	50 ½	18	93 6/8
Don Honorio Ventura por Don Ramon del Rosario		49	16	6	00
Doña Lina Sito Siguienza		51	12	4	50
Don Telesforo Feliz		53	23	8	62 4/8
Doña Ciriaca de los Santos		-	5 ½	2	06 2/8
Don Antonio Tong		2	16	6	00
Don Leandro Gruet		4, 6, 8	115 2/3	43	37 4/8
Doña Maria Romana Bernardo		12	22	8	25
Don Manuel Feroz Loureiro		18	9	3	37 4/8
Don Honorio Valenzuela		20	31	11	62 4/8
Doña Trinidad Gómez		22	13	4	87 4/8
Id._____ Id._____		24	16 ¾	6	28 1/8
Doña Maria Carlos		26	30 ½	11	43 6/8

El Gobernadorcillo de Chinos		28	17 ½	6	56 2/8
Doña Juana Garcia		30	27 ½	10	12 4/8
Don Francisco Mortera		32	20	7	50
Don Vicente Gregorio Alberto		34	20 1/4	7	59 3/8
Los Señores Roxas Hijos		36	40	15	00
Don José Maria Basa		38	47	17	62 4/8
Don Jorge Villoria por el Señor Huett		40	21 ½	8	06 2/8
Doña Magdalena Alvares de los Santos		42	15 ¼	5	71 7/8
Doña Dolores Tuason		-	5 ½	2	06 2/8
Don José Lago		44	16	6	00
Don Prudencia Cuyungan		46	9 1/3	3	50
Don Vicente Reig		-	57	21	37 4/8
Doña Joaquin Baza		-	30	11	25
			SUMA	427	84 3/8
Don Francisco Mortera	Callejón de la Nueva	1	14	5	25
Don Jorge Villoria		2	13 ½	5	06 2/8
Don Martin Santiago		3	13 ½	5	06 2/8
Doña Lina Soto Liguenza		-	7 2/3	2	87 4/8
Id._____ Id._____		3	9	3	37 4/8
Don Manuel Callejas		4	12 ¾	4	78 1/8
Doña Magdalena Casal		5	16 1/3	6	12 4/8
			SUMA	32	53 1/8
Don Vicente Cuyugan	Olivares	1	41	15	37 4/8
Doña Claudia Beltran		2	12 ¼	4	59 3/8
Don Gavino Carriedo		3	12 ¼	4	59 3/8
Doña Joaquin Fernandez		4	4	1	50
Doña Maria Ducepec		5	16 1/3	6	12 4/8
Don Feliz Araullo		5	7 1/3	2	75
Doña Maria Verzosa de Sunico		5	10 ¾	4	03 1/8
Don Francisco Cuyugan		6	6 1/3	2	37 4/8
Doña Benita Saguingsing		7	5 ½	2	06 2/8
Don Leandro Gruet		8	44	16	62 4/8
			SUMA	60	03 1/8
Don Vicente Aviles	Plaza de Doña Jacoba	1	209 ½	78	56 2/8
Don José de las Cagigas		2	58	21	75
Id._____ Id._____		2	122	45	75
			SUMA	146	06 2/8
Don Leandro Gruet	Rosario	1	13 1/3	5	00
Don José Ochoa		2	23	8	62 4/8
Doña Josefa Ramos Fajardo		3	3 ½	1	31 2/8
Doña Ciriaca de los Santos		4	15 ½	5	81 2/8
El albacea de Doña Maria Beltran		5	15 ½	5	81 2/8
Don Francisco Cocullo		6	15	5	62 4/8
Don Evaristo Osorio		7	12 ¼	4	59 3/8
Los Hijos de Doña Maria Cuyugan		8	17 2/3	6	62 4/8
Don Ramon Cadoruga		9	22 ½	8	43 6/8
Doña Benita Saguingsing		10	11 ¾	4	40 5/8
Los Hijos de Doña Maria Cuyugan		11	13	4	87 4/8
Don Honorio Valenzuela		12	11	4	12 4/8
Don Vicente Gregorio Alberto		13	25 ½	9	56 2/8
Don Eduardo Resurrección Hidalgo		14	10	3	75
Doña Lucina Arroyo		15	13 ½	5	06 2/8
Sor. Don José Ma. Tuason		16	16 2/3	6	25
Don Antonio Tong		17	12	4	50
Id._____ Id._____		18	13	4	87 4/8
Doña Macaria Caraylina		19	13 2/3	5	12 4/8

Sor. Apoderado del Hospicio		21	50	18	75
Los Hijos de Capitan Paterno		21	29 ½	11	06 2/8
Don Quintin Abreu		22	10 ½	3	93 6/8
Don José Ochoa		23	7	2	62 4/8
Sr. Don José Ma. Tuason por Don Ramon OFarrell		23	16 ½	6	18 6/8
M.R.P. Procurador General de Sto. Domingo		24	23	8	62 4/8
El Cura de Binondo		-	12	4	50
M.R.P. Procurador General de Sto. Domingo		25	228	85	50
Don Miguel Wenceslao Serrano		26	39 ½	14	81 2/8
Doña Maria Somes de Butler		27	9	3	37 4/8
Don Leandro Gruet		28	16 2/3	6	25
Doña Dolores Moran		29	50 2/3	18	87 4/8
Doña Diega de Castro		30	39 ½	14	81 2/8
Los Señores Roxas Hijos		31	4 2/3	1	75
Don Manuel Grey		32	48	18	00
Los Señores Rocha y Ycaza		1 hasta el 8	28	10	50
Sor. Don José Ma. Tuason por Don José Ferreras		33	23 1/4	8	71 7/8
Don José Ma. Tuason		33	3	1	12 4/8
Doña Maria Tuason		33	2	0	75
Id._____ Id._____		34	41	15	37 4/8
Id._____ Id._____		35	26	9	75
Id._____ Id._____		36	14	5	25
Doña Maria Gómez de Butler		37	13 ½	5	06 2/8
Don Felipe Arenas		38	56 ¾	21	28 1/8
La viuda del Chino Laopico		39	43 ½	16	31 2/8
Don José Ortega		40	21	7	87 4/8
Don José Luis de Ainciburo		-	18	6	75
Don Valentin Mascaró		41	63 ½	23	81 2/8
			SUMA	456	00
Don Leandro Gruet	Callejón del Rosario	1	8 2/3	3	25
Don Pedro Evaristo		2	18 2/3	7	00
Don Jorge Villoria por el Sor. Huett		3	8 2/3	3	25
Don Pablo Garcia		-	8	3	00
Don Francisco Picó		4	9 1/3	3	50
Doña Ana Mauricio		5	18	6	75
El Chino Lim-Congcay		6	15 ½	5	81 2/8
Doña Carmen Fernandez de Luna		7	13 ½	5	06 2/8
Don Eduardo Resurrección e Hidalgo		8	13	4	87 4/8
Doña Vicente Roxas		9	19 1/6	7	18 6/8
			SUMA	49	68 6/8
Don Jorge Villoria por el Sor Huett	Callejón de San Gabriel	1	31 ½	11	81 2/8
Don Manuel Blanco		2	16	6	00
Don Francisco Rodriguez		3	18 ½	6	93 6/8
Id._____ Id._____		4	8 ½	3	18 6/8
Id._____ Id._____		5	23 ½	8	81 2/8
Id._____ Id._____		6	133 7/10	50	12 4/8
Sor. Don José Maria Tuason por Don Ramon OFarrell		7	68 ½	25	68 6/8
			SUMA	112	56 2/8
Don Francisco de Paula Cembrano	San Jacinto	1	69 ½	26	06 2/8
Don Vicente Vales		2	86	32	25
Don Rosauro Cortes		3	26 ¾	10	03 1/8
Doña Catalina Leyva		3	17	6	37 4/8
Don Teodoro Revulla por Doña Clara Leyba		3	16 ½	6	18 6/8
Don Mariano Roxas		4	95 ¼	35	71 7/8
Don Vicente Gregorio Alberto		5	35 ½	13	31 2/8

Don José Aguirre		6	23	8	62 4/8
Don Manuel Azcarraga		6	5	1	87 4/8
Don Miguel Abraham		6	62 1/6	23	31 2/8
Don Lorenzo Yparraguirre		-	38	14	25
Don Antonio Mendoza		-	8	3	00
Don Joaquin Morello		7	73 1/3	27	50
Don José Dimaguiba		8	42 2/3	16	00
Doña Maria Pelaez de Gonzales		8	29 ½	11	06 2/8
La viuda de Don Juan Garay		-	13	5	06 2/8
Don José Ferrer		9	17	6	37 4/8
Don Pedro Pelaez		10	25 ½	9	56 2/8
Don José Maria Basa		11	56 5/12	20	78 1/8
Id._____ Id._____		12	34 1/6	12	81 2/8
Sor. Don Tomas Balbas y Castri		13	22	8	25
Doña Maria Basa		14	18	6	75
Doña Ignacia Eusevia		15	13 ¾	5	15 5/8
Doña Gregoria Maria		16	16	6	00
Don Marcos de San José		17	20 2/3	7	75
Don José Maria Basa		18	9 2/3	3	62 4/8
Don Sixto Ejada Obispo		C	35	13	12 4/8
Don Francisco de los Reyes		-	20 1/3	7	62 4/8
Id._____ Id._____		.	12 1/3	4	62 4/8
Id._____ Id._____		-	8	3	00
Id._____ Id._____		19	34 ½	12	93 6/8
Id._____ Id._____		-	5	1	87 4/8
Doña Petronila Fuentes		21	17	6	37 4/8
Doña Paulina Roxas		22	26 ¼	9	84 3/8
Doña Prudencia Cuyugan		23	9 ¾	3	65 5/8
Don José Miranda		24	11	4	12 4/8
Doña Dolores Tuason		25	6 ¼	2	34 3/8
Doña Magdalena Alvarez de los Santos		26	14	5	25
Doña Telesforo de los Reys		27	33	12	37 4/8
Don José Maria Basa		-	35	13	12 4/8
Los Señores Roxas Hijos		D	54 ¼	20	34 3/8
Don Augusto Van Polamen Petell		28	30	11	25
Id._____ Id._____		28	57 2/3	21	62 4/8
Doña Maria Carlos		28	89	33	37 4/8
Don Rosauro Cortes		-	30	11	25
Don José Aguirre		-	18	6	75
Don Tomas de Leon		28	12	4	50
Don Vicente Roxas		-	106 ¾	40	03 1/8
Don Rosauro Cortes		-	3 2/3	1	37 4/8
Don Tomas de Leon		30	16	6	00
Don Vicente Roxas		31	49 ¾	18	65 5/8
Don Vicente Aguirre		-	5 ½	2	06 2/8
Doña Paulina Roxas		31	21 ¼	7	96 7/8
Doña Maria Justa		31	16 ½	6	18 6/8
Don Juan Romero		32	28 2/3	10	75
Don Vicente Vales		-	14 1/3	5	37 4/8
Don Vicente Reig		-	17 ½	6	40 5/8
Don Ignacio Ponce de Leon		32	28 1/3	10	62 4/8
Don Manuel Genaro como albacea de los Florentinos		33	9 1/3	3	50
Don Felipe Santiago		-	10 1/3	3	87 4/8
Don Pedro de Porras		-	31	11	62 4/8
Don Antonio Berniz		-	7 2/3	2	87 4/8
Don Francisco Mañalac		-	12 ½	4	68 6/8
Don José Maria Basa			22 5/6	8	56 2/8

El Chino Manuel Azcarraga			7	2	62 4/8
Don Narciso de los Angeles			10 ¾	4	03 1/8
Don Eustaquio de Leon			25 2/3	9	62 4/8
			SUMA	703	90 5/8

Nº de los recibos						
843	Don José Aguirre	Sacristía	1	72	27	0
844	Dª Petronila Fuentes		1	18	6	75
845	Id._____ Id._____		2	40	15	0
846	Dª Calixta Javier de Torres		3	23 1/3	8	75
847	M.R. Cura Párroco de Binondo		Convento e iglesia	192 1/2	72	12 4/8
848	Dª María Torres de Butler		..	28 2/3	10	75
849	D. Vicente Gregorio Alberto		4	14 1/2	5	43 6/8
850	D. Feliz Pardo		5	20	7	50
851	D. Antonio Gong		6	17 1/2	6	56 2/8
852	La viuda de D. Ambrosio Monroy		7	9	3	37 4/8
853	D. Ramón Ignacio		8	11 1/3	4	37 4/8
854	D. Antonio Gong		9	28	10	50
855	D. Eduardo Resurrección e Hidalgo		C	18 1/2	6	93 6/8
856	D. José de las Cagigas		10	5	1	87 4/8
857	D. Juan Morales		D	27 1/6	10	18 6/8
858	Dª Martina de los Reyes		11	10 3/4	4	03 1/8
859	D. José María Bara		12	39	14	62 4/8
860	D. José Nicolás Medina		13	70 2/3	26	50
				SUMA	242	28 1/8
861	D. Juan Reyes como Albacea	San Vicente	1	44	16	50
862	D. Teodoro Revilla y Dª Clara Leyba		2	17	6	37 4/8
863	Dª Lucina Arroyo		3	57	21	37 4/8
864	D. Feliz Pardo		A	38	14	43 6/8
865	D. Leandro Urnes		B	30	11	25
866	Dª Ciriaca de los Santos		C	18	6	75
867	Dª Francisca Luciana de la Gracia		4	16 1/2	6	18 6/8
868	Sor. D. Tomás Balbas y Castro		4	15 3/4	5	90 5/8
869	D. Ignacio de Baza		5	47 5/6	17	93 6/8
870	Dª Paulina Roxas		..	42	15	75
871	Dª Paulina Roxas	San Vicente	6	18 1/4	6	84 3/8
872	Dª Margarita Roxas		7	34 1/3	13	00
873	D. Bartolo Mª de Serra		8	30 5/6	11	56 2/8
874	D. Alejandro de León		..	7 1/2	2	84 2/8
875	D. Ramón Argüelles		..	5 1/2	2	06 2/8
876	D. Teodoro de Jesús		9	8 1/3	3	12 4/8
877	Dª Lucina Arroyo		9	20 2/3	7	75
878	Dª Bonifacia Mariana		10	8 1/2	3	18 6/8
879	Id._____ Id._____		11	7 1/3	2	75
880	D. Manuel Torres		12	41 1/4	15	46 7/8
881	D. José Ochoa		13	54 2/3	20	50
882	M.R.P. Provincial de San Juan de Dios		14	17	6	37 4/8
883	Dª María Gómez de Butler		15	29 2/3	11	12 4/8
				SUMA	229	3 1/8
884	El Chino Juan Contuan	Suspiros	..	19	7	12 4/8
885	D. José Aguirre		..	52	49	50
886	D. Feliciano Antonio		1	16 2/3	6	25
887	D. Juan Cabarrus		2	10 1/3	4	00
888	Id._____ Id._____		3	14	5	25
889	Id._____ Id._____		..	39 3/4	14	90 5/8
890	D. Catalino Villafranca		4	56 1/2	21	18 6/8
891	D. José Parenal Lugo		5	43	16	12 4/8
892	D. Ignacio Ponce de León		..	32 1/2	12	18 6/8
893	D. Vicente Reig		5	11	4	12 4/8
894	D. Ignacio Ponce de León		5	34	12	75
895	Id._____ Id._____		5	39	14	62 4/8

896	D. Antonio Enriquez		Teatro	212 1/2	79	68 6/8
897	D. Ezequiel del Rosario		..	21	7	87 4/8
898	D. Manuel Feroz Loureiro		..	25 1/3	9	50
899	D. Francisco Mortera		..	22	8	25
900	Dª Juana Gabriela		..	14	5	25
901	Dª Albina Bautista		..	6 1/2	2	43 6/8
				SUMA	251	3 1/8
902	Dª Petronila Fuentes	San Fernando	1	5 1/2	2	06 2/8
903	D. Vicente Gregorio Alberto		2	22 1/3	8	37 4/8
904	Id._____ Id._____		2	8 2/3	3	25
905	Id._____ Id._____		3	17	6	37 4/8
906	D. Teodoro Revilla y Dª Clara Leyba		4	6 1/4	2	34 3/8
907	D. Valentín Mascaró		5	6 1/4	2	34 3/8
908	Dª Tomasa Laochangco		6	6/8	4	87 4/8
909	D. Vicente Pablo Gemuyo		7	34	12	75
910	D. Macario de los Reyes		8	6 1/2	2	43 6/8
911	D. Teodoro Revilla		9	10 1/2	3	93 6/8
912	Dª Magdalena Alvarez de los Santos		10	7	2	62 4/8
913	D. Mariano Cecilio		11	15	5	62 4/8
914	D. Vicente de Gregorio Alberto		12	23 1/3	8	87 4/8
915	Dª Claudia Beltrán		13	17 2/3	6	62 4/8
916	D. Vicente de Gregorio Alberto		14	16 1/2	6	18 6/8
917	Dª Cecilia Leyba		16	65 1/2	24	68 6/8
918	M.R. Prior de Sto. Domingo		24	64	24	00
919	D. Serafín Ignacio		..	10 3/4	4	03 1/8
920	D. Juan Romero		..	36	13	50
921	D. Pedro Antonio Vidal		..	20 1/2	7	68 6/8
922	D. Victorio de los Reyes		..	9 2/3	3	62 4/8
923	Dª María Natalia		17	12	4	50
924	D. Vicente Arrieta		18	9 1/2	3	56 2/8
925	D. Manuel Blanco		20	30	11	25
926	D. Ceferino Joven		20	16 1/3	6	12 4/8
927	D. Macario de los Reyes		22	13 1/3	5	00
928	D. Genaro Raymundo		23	18 1/2	6	87 4/8
929	D. Joaquín Morello		24	68 1/4	25	59 3/8
930	Dª Rosa Manuel Tesón		25	8 1/2	3	18 6/8
931	D. Vicente Vales		26	4 1/4	1	59 3/8
932	D. Valentín Mascaró		27	4 1/4	1	59 3/8
933	El Chino José Diangien		..	21 1/4	7	96 7/8
934	D. José de las Cagigas		29	58 1/2	21	93 6/8
				SUMA	255	40 5/8
935	Dª María Torres de Butler	Sto. Cristo	1	81 1/4	30	46 7/8
936	Los hijos de D. Pablo Tuason		2	82 1/2	30	93 6/8
937	D. José Corrales		3	38 1/2	14	43 6/8
938	D. Ceferino Joven		4	16 1/2	6	18 6/8
939	Id._____ Id._____		5	12	4	50
940	D. José Corrales		6	19 1/3	7	25
941	D. Antonio Gong		7	5 1/2	2	06 2/8
942	Dª María Gómez de Butler		8	24 1/2	9	18 6/8
943	D. Narciso Padilla		9	51 1/3	21	50
944	Dª Potenciana de la Cruz		10	74 1/3	27	87 4/8
945	Dª Felipa Feliciano		..	8 1/4	3	9 3/8
946	Dª María Gómez de Butler		..	11 1/4	4	21 7/8
947	D. Rafael Fernando		11	33 1/3	12	50
948	D. Telesforo Feliciano de Lara		..	29	10	87 4/8
949	D. Francisco Cuyugan		..	13	4	87 4/8
950	D. José ¿Dimagriula?		..	13	4	87 4/8
951	Dª Juana de Dios Cruz de Brun		..	11	4	12 4/8

952	Dª Josefa Gutiano		12	35 3/4	13	40 5/8
953	D. Honorio Ventura		12	10 5/6	4	6 2/8
954	Id._____ Id._____		13	21 3/4	8	15 5/8
955	Id._____ Id._____		13	11 1/2	4	31 2/8
956	Dª Lucía Pineda		13	40 3/4	15	28 1/8
957	Dª Luisa Limona		14	64 1/4	24	9 2/8
958	D. José Ferrer		15	22	8	25
959	D. Vicente Reig		16	3	1	12 4/8
960	D. José Gervasio Sierra		17	12 3/4	4	78 1/8
961	D. José ¿Crane?		18	12 3/4	4	78 1/8
962	D. José Miranda		18	10 2/3	4	00
963	Id._____ Id._____		..	12 1/3	4	62 4/8
964	Dª Gaidra Belmonte		..	7 1/3	2	75
965	D. Dalmacio Oligario		..	14 1/2	5	43 6/8
966	Dª Leonor Zaballa		..	10 1/4	3	84 38
967	Dª Magdalena Roig		..	8 3/4	3	28 1/8
968	D. Vicente Arrieta		..	8 5/8	3	23 7/16
969	D. Juan Adriano		..	8 5/8	3	23 7/16
970	Dª Josefa Roxas de la Concha		23	7 1/3	2	75
971	D. Juan Adriano		..	9 1/3	3	50
972	Dª Hermogena Mendez		24	10	3	75
973	D. Baldomero Pantoja		24	20	7	50
974	D. Ambrosio Casas		24	43	16	12 4/8
975	D. Marcos de San José		..	10	3	75
976	D. Saturnino Lim Caeo		..	13 1/4	4	96 7/8
977	Dª María Gomez de Butler		..	65 1/2	24	56 2/8
978	M.R.P. Prior de Santo Domingo		..	65 1/4	24	46 7/8
979	Dª Juana Tamayo		25	16 2/3	6	25
980	D. Teodoro Revilla		26	16 2/3	6	25
981	M.R.P. Procurador general de Santo Domingo		..	64	24	00
982	Dª Juana (¿?) de Bustamante		26	27 1/2	10	31 2/8
983	D. Clemente Lizola		26	59 2/3	22	34 4/8
984	Dª Josefa Roxas de la Concha		X	27 1/4	10	21 7/8
985	Dª María Gomez de Butler		..	9 1/3	3	50
986	D. Genaro Raymundo		..	8 1/6	3	6 2/8
987	Id._____ Id._____		..	8 1/2	3	18 6/8
988	D. Fausto Fang-Changeo		..	9	3	37 4/8
989	D. Roman Ignacio		..	21 1/3	7	62 4/8
990	D. Vicente Gregorio Alberto		..	7 1/3	2	75
991	Dª Ana Mauricio		27	48 1/3	18	12 4/8
992	D. Juan Nepomuceno Cordoba		27	36 1/2	12	68 6/8
993	D. Vicente Aviles		28	234 1/2	87	93 6/8
994	El Chino José Carlos Siseco		29	12	4	50
995	Id._____ Sy Yiap		30	12	4	75
996	Id._____ Chuidian		31	8 2/3	3	25
997	Id._____ D. Antonio Zong		32	34 1/4	12	84 3/8
				SUMA	656	0
998	D. Lorenzo Yparraguirre	Sto. Cristo	..	44 1/2	16	68 6/8
999	D. Matías López de Hoiz		..	7	2	62 4/8
1000	D. Honorio Ventura		..	45 1/3	17	00
1001	Id._____ Id._____		..	14	5	25
1002	Id._____ Id._____		..	13 1/2	5	06 2/8
1003	D. Honorio Ventura	Callejones de Sto. Cristo	Posesiones	27	10	12 4/8
1004	El Chino Luna		Camarines	72	27	00
1005	D. Gregorio Hipólito		..	14	5	25
1006	Id._____ Id._____		Posesiones	18	6	75
				SUMA	95	75

1007	D. Vicente Vales	2ª calle de Sto. Cristo	1	37	13	87 4/8
1008	Id._____ Id._____		2	14 3/4	5	53 1/8
1009	D. Vicente Arenas		3	46 1/3	17	37 4/8
1010	D. Feliciano Antonio		4	8	3	00
1011	La Viuda de D. José María Tuason		4	13	4	87 4/8
1012	D. Ignacio Ponce de León		4	5 1/3	2	00
1013	Dª Josefa Roxas de la Concha		5	25 1/2	9	56 2/8
1014	Id._____ Id._____		6	18 1/4	6	84 3/8
1015	D. Apolonio Concha		7	11	4	12 4/8
1016	D. Eugenio del Rosario		8	10 1/2	3	93 6/8
1017	Dª Tomasa Laochangco		8	12 1/4	4	59 3/8
1018	D. Teodoro Revilla y Dª Basilia Bauson		9	15	5	62 4/8
1019	D. Aniceto Dionisio		..	6 1/12	2	28 1/8
1020	D. Antonio ¿Berniz?		..	11	4	12 4/8
1021	Dª María del Rosario		9	39	14	62 4/8
1022	El Chino Juan Contuan		5	52 2/3	19	75
1023	D. Mateo Nava Francisco		..	14 1/3	5	37 4/8
1024	D. Gabriel Gutierrez		..	11 1/2	4	31 4/8
1025	D. Ceferino Joven		..	39	14	62 4/8
1026	D. Simplicio del Prado		10	14 1/3	5	37 4/8
1027	D. Isidoro Lopez Cordero		11	42	15	78 1/8
1028	D. Manuel Arce		12	10 1/2	3	93 6/8
1029	D. Manuel Callejas		..	5 1/2	2	6 2/8
1030	Dª Benita Salvador		..	13 5/6	5	18 6/8
1031	D. Antonio Rodriguez		13	14 1/3	5	37 4/8
1032	El Chino Luna		13	21	7	87 4/8
1033	Los Hijos de D. Pablo Tuason		13	17 1/3	6	50
1034	Dª Tomasa Laochangeo		13	5 1/3	2	00
1035	Dª Cristina Cesarea		14	31 3/4	11	90 5/8
1036	D. Francisco Zambrano	2ª calle de Sto. Cristo	15	42		
1037	D. Clemente Cecilio		16	8 1/2		
1038	D. Juan Sartory		17	21 1/4		
				SUMA	239	34 3/8
1039	D. Manuel Callejas	3ª calle del Sto. Cristo	..	12	4	50
1040	D. Honorio Ventura		..	130 1/3	48	87 4/8
1041	D. Balbino Arevalo		..	33 1/4	12	46 7/8
1042	Dª Marina de los Santos		..	12	4	50
1043	D. Luis Villarin		..	9 1/4	3	46 7/8
1044	D. Remigio Chu-Diongeo		..	16	6	00
1045	D. José Ochoa		..	23 3/4	8	90 5/8
1046	D. Santos Reyes		..	12	4	50
				SUMA	93	21 7/8
1047	M.R.P. Procurador general de Santo Domingo	Plaza de Vives	1	67	25	12 4/8
1048	Id._____ Id._____ Id._____		2	16 1/2	6	18 6/8
1049	Id._____ Id._____ Id._____		3	17	6	37 4/8
1050	Id._____ Id._____ Id._____		4	60 1/2	22	68 6/8
1051	Dª Candelaria Fernandez		5	50	18	75
1052	D. Pedro Lacambra y la viuda del Sr. de Andrés		6	16 1/2	6	18 6/8
1053	D. Francisco ¿Yeeller?		7	9 1/2	3	56 2/8
1054	Sr. D. José María Tuason y D. Ramon O Farrell		8	226 1/2	84	93 6/8
				SUMA	173	81 2/8
1055	Sr. D. Tomas Balbar y Castro	San Nicolás	..	165	61	87 4/8
1056	D. Manuel ¿Copero?		..	80	30	00
1057	D. Domingo ¿Duepee?		..	41	15	37 4/8
1058	D. Florencio Yllana		..	40	15	00
				SUMA	122	25

1059	Dª Luisa Romero	Trozo	..	35	13	12 4/8
1060	D. Teodoro Revilla		..	30	11	25
1061	Id._____ Id._____		..	12	4	50
1062	Dª Antonia del Rosario		..	10	3	75
1063	D. Manuel Tuason		..	16	6	00
1064	D. Diego Viña			38	14	25
				SUMA	52	87 4/8
1065	M.R.P. Procurador de San Agustín	Urdaneta	..	25 1/3	9	50
1066	Id._____ Id._____ Id._____	..	..	25 1/3	9	50
1067	Dª Cornelia Laochengeo	Caballero	..	33	12	37 4/8
1068	D. Honorio Ventura	2ª calle de Sto. Cristo	..	35 1/2	13	31 2/8
1069	D. Valentín Mascaró	San Fernando	28	5	1	87 4/8
1070	Dª María ¿Cuengea?	Caballero	..	21	7	87 4/8
1071	D. Mariano de los Reyes	..	..	14	5	25
1072	Dª Cornelia Laochengeo	..	..	14	5	25
1073	Dª Sabrina Velasco	Anloague	..	17	6	37 4/8
1074	Dª Potenciana de la Cruz	Ilangilang	..	7 1/3	2	75
1075	D. Clemente Alcantara	Solo	..	8	3	00
1076	D. Andres Lopez	..	..	17 1/3	6	50
1077	Dª Francisca Luciana de la Gracia	San Vicente	..	8	3	00
1078	Dª Paulina Roxas	..	..	9	3	37 4/8
1079	Dª Valentina Tamayo	2ª calle de Sto. Cristo	..	13	4	87 4/8
1080	D. José Varela y su hermana Dª María	Sto. Cristo	..	14 7/12	5	46 4/8
1081	D. Dalmacio Oligario	..	..	18	6	75
1082	D. Gregorio Hipólito	3ª calle del Sto. Cristo	..	18	6	75
RELACIÓN DE LOS EDIFICIOS DEL ESTADO Que están obligados al pago de la contribución para el sostenimiento del Alumbrado Público y limpieza de las calles correspondientes al año de 1862						
1083		Palacio	..	557 1/3	209	00
1084		Sta. Luisa	..	127	47	62 4/8
1085		..	..	250	93	75
1086		Aduana	..	272	102	00
1087		Cabildo	..	277 1/3	104	00
1088		Maestranza	..	65 2/3	24	62 4/8
1089		..	..	359	134	62 4/8
1090		Hospital	..	301 1/3	113	00
1091		Cabildo	..	47	17	62 4/8
1092		Palacio	..	362 2/3	136	00
1093		Audiencia	..	99 1/3	37	25
1094		Palacio	..	69 2/3	26	12 4/8
1095		..	..	106 2/3	40	00
1096		Plaza de la ¿?	..	104	39	25
1097		Plaza de Palacio	..	377	141	37 4/8
1098		San Fernando	..	235 2/3	88	37 4/8
1099		Cabildo	..	156 1/2	58	68 6/8
1100		Anda	..	94 2/3	35	50
				SUMA	1448	81 2/8

RESUMEN CALLE	PESOS	CÉNTIMOS
Arzobispo	285	65 5/8
Audiencia	64	50
Anda	405	21 7/8
Beaterio	309	18 6/8
Basco	56	34 3/8
Baluarte	26	34 3/8
Cabildo	560	12 4/8
Hospital	14	25

Legaspi	145	40 5/8
Magallanes	468	84 3/8
Mercado	18	75
Muralla	39	93 6/8
Palacio	726	53 1/8
Fuerza	32	43 6/8
Real	714	37 4/8
Recoletos	185	62 4/8
Solana	610	68 6/8
San Juan de Letrán	138	84 3/8
San Juan de Dios	37	12 4/8
San Francisco	25	21 7/8
Sta. Potenciana	78	33 6/8
San Agustín	85	21 7/8
San José	33	37 4/8
Sto. Tomás	131	6 2/8
Sta. Lucía	65	71 7/8
Victoria	356	9 3/8
Anloague	338	3 1/8
Barraca	416	21 7/8
Andén de la Barraca	19	65 5/8
Caballero	41	28 1/8
¿Carenero?	54	46 7/8
David	130	71 7/8
Escolta	501	6 2/8
Ilanguilan	62	12 4/8
Jaboneros	567	53 1/8
Jolo	355	28 1/8
Callejón de Pereyra	49	00
Hongos	135	3 1/8
Murallón	95	25
Calle Nueva	427	84 3/8
Callejón de la Calle Nueva	32	53 1/8
Olivares	60	3 1/8
Plazuela de Dª Jacoba	146	6 2/3
Rosario	456	00
Callejón del Rosario	49	68 6/8
San Gabriel	112	56 2/3
San Jacinto	703	90 5/8
Sacristía	242	28 1/8
San Vicente	229	3 1/8
Suspiros	251	3 1/8
San Fernando	255	40 5/8
Sto. Cristo	656	00
Callejón de Sto. Cristo	95	75
Segunda calle de Sto. Cristo	239	34 3/8
Tercera calle de Sto. Cristo	93	21 7/8
Plazuela de Vives	173	81 2/8
San Nicolás	122	25
Trozo	52	87 4/8
Edificios nuevos	113	78 1/8
Edificios del Estado	1448	81 2/8
TOTAL	14343	68 3/4

Manila, a 5 de Mayo de 1862
El Mayordomo de Propios
(Firma)

CALLE PRÍNCIPE

Relación de los propietarios de solares que han sido comprendidos en la apertura de la expresada calle con expresión de los valores de terreno que se han ocupado y señalado en compensación.

NOMBRES	Nº DE ORDEN	VARAS CUADRADAS QUE SE LE HAN OCUPADO	TOTAL	Nº DE LA COMPENSACIÓN	VARAS CUADRADAS QUE SE LE HAN DADO	TOTAL	VARAS QUE LE FALTAN QUE INDEMNIZAR	PRECIO POR VARAS CUADRADAS (EN ESCUDOS)	VALOR TOTAL (EN ESCUDOS)
D. Joaquín Prat	143	Calle del Príncipe Ciento	100	,,	,,	,,	100	8	800
D. Pedro Antonio Vidal	144	Id. Id. Doscientos siete	207	,,	,,	,,	207	8	1656
Dª María Casas	145	Id. Id. Mil ochocientos sesenta y ocho	1868	135	Ant.ª pescadería: trescientos ochenta	380	1488	7	10416
D. Miguel Abrahams	146	Id. Id. Cuatrocientos noventa y dos 492	541	136	Id. Id. : cuatrocientos cuarenta	440	101	5	505
	147	Id. Id. Cuarenta y nueve 19							
Antonio Bartolomé	147 1/2	Id. Id. Noventa y nueve	99	,,	,,	,,	99	4	396
Chino Luis ¿Oraá?	148	Id. Id. Ciento cuarenta y cuatro 144	2840						
	149	Id. Id. Trescientos ochenta y cuatro 384		137	Calle Ant.ª Nazaret: trescientos veinte y dos 322	984	1856	5	9280
	150	Id. Id. Mil ochenta y seis 1086		137	Id. Id. Inmediata: seiscientos sesenta y dos 662				
	151	Id. Id. Mil doscientos vente y seis 1226							
Martina Ruiz	152	Id. Id. Ochenta y cuatro	84	,,	,,	,,	84	5	420
Cayetano Reyes	153	Id. Id. Ciento doce	112	139	Calle Ant.ª Inmediata: ciento doce	112	,,	,,	,,
Nemesio Medina	154	Id. Id. Ciento treinta	130	140	Id. Id. de Id.: ciento treinta	130	,,	,,	,,
Dª Margarita Rojas	155	Id. Id. Doscientos treinta y dos	232	,,	,,	,,	232	5	1160
Bernardino Prado	156	Id. Id. Trescientos ochenta y dos	382	,,	,,	,,	382	5	1910
Bernardino Ygcasañas	157	Id. Id. Setenta y ocho	78	,,	,,	,,	78	4	312
Trinidad Morelló	158	Id. Id. Ciento cincuenta	150	,,	,,	,,	150	4	600
Juan Zulueta	159	Id. Id. Doscientos	200	,,	,,	,,	200	4	800
Paulina de Ocampo	160	Id. Id. Ochenta	80	,,	,,	,,	80	4	320
Macaria ¿Munji?	161	Id. Id. Ciento sesenta y tres	163	,,	,,	,,	163	4	652
Ángela Agraz	162	Id. Id. Ciento cuarenta y cinco	145	,,	,,	,,	145	4	580
Tomás Rivera	162 1/2	Id. Id. Ochenta y cuatro	84	,,	,,	,,	84	4	336
¿Sotero Rivadiu?	163	Id. Id. Ciento cuarenta	140	,,	,,	,,	140	4	560

Cirilo Gallardo	164	Id. Id. Cuatrocientos	400	´´	´´	´´	400	4	1600
José Alejo	165	Id. Id. Ciento treinta y tres	133	´´	´´	´´	133	4	532
Feliciano Raymundo	167 (no hay 166)	Id. Id. Cincuenta y una	51	´´	´´	´´	51	4	204
Mariano Castro Carlos	168	Id. Id. Ciento veintiuna	121	´´	´´	´´	121	3	363
Ygmidio Anastasio	169	Id. Id. Ochenta y cuatro	84	170	Call. N. Principe Lav.& playa: ochenta y cuatro	84	´´	´´	´´
Margarita Vicario	170	Id. Id. Trescientos seis	306	165 165 1/2	Id. y trapecio q.e. sig.e.Principe Lav.& Playa: ciento ocho 108 Id. Príncipe Sevilla Lav.&. Y Peñarrubia: treinta y tres 33	141	165	3	495
Victor Ramos	171	Id. Id. Veinte y siete	27	´´	´´	´´	27	2	54
Basilio Reliquias de Mártir	172	Id. Id. Noventa y ocho	98	161	Id. Ant.º inmed.to: noventa y ocho	98	´´	´´	´´
Bernabé de San Luis	173	Id. Id. Quinientos	500	´´	´´	´´	500	2	1000
Andrés García	174 175	Id. Id. Doscientos treinta y cuatro 234 Id. Id. Cuatrocientos treinta y cinco 435	669	162	Playa San Vicente y Vives: trescientos veinticuatro	324	345	2	690
José Evangelista	176	Id. Id. Ochenta	80	173	Callejón Príncipe Lav.&. y playa: ochenta	80	´´	´´	´´
Pablo Marcelo Albarillo	177 178	Calle del Principe: ciento veinticinco 125 Id. Id. Ochenta y ocho 88	213	164	Playa y Calle de Vives: doscientos trece	213	´´	´´	´´
Mateo Nava Francisco	179	Id. Id. Setenta y una	71	171	Callejón Sev.llas Peñarrubia y playa: setenta y una	71	´´	´´	
Rafaela Zalazar	180	Id. Id. Cincuenta y nueve	59	167	Calle de Lav.& orilla de la playa: cincuenta y nueve	59	´´	´´	´´
Ciriaca ¿Campopus?	181	Id. Id. Ciento diez	110	174	Playa extremo Sur de la calle del Príncipe: ciento diez	110	´´	´´	´´
Catalina Goicochea	182	Id. Id. Doscientos setenta y seis	276	145	Esquina San Vicente Sevilla: ciento treinta y ocho	138	´´	´´	´´
Fulgencio Barlong	183	Id. Id. Ciento setenta	170	172	Callejón entre Sevilla, playa Peñarrubia y Divisoria: ciento setenta	170	´´	´´	´´
Lorenzo Ramos	183 1/2	Id. Id. Sesenta y cuatro	64	168	Id. frente a su solar nº 59 de la Calle de Peñarrubia: cuarenta y cuatro	44	20	2	40
Chino Yap Sua	184	Id. Id. Ciento sesenta y nueve	169	169	Id. de Lav.& Inmediato a la playa: ciento sesenta y nueve	169	´´	´´	

TOTAL	**3747**	**7351**	´´	**35681**

Manila 5 de Diciembre de 1866.
(FIRMAS)

Nota: La diferencia que resultan entre el total de varas tomadas y compensadas, consiste en que se han diferenciado en la compensación, con acuerdo de los interesados, pequeñas diferencias de algunas varas, a fin de no expedir bonos, por un valor insignificante.

MUELLE DE LA REYNA Y CALLES DE LA ZONA DE MATERIALES LIGEROS

NOMBRES	Nº DE ORDEN	VARAS CUADRADAS QUE SE LE HAN OCUPADO	TOTAL	Nº DE LA COMPENSACIÓN	VARAS CUADRADAS QUE SE LE HAN DADO	TOTAL	VARAS QUE LE FALTAN QUE INDEMNIZAR	PRECIO POR VARAS CUADRADAS (EN ESCUDOS)	VALOR TOTAL (EN ESCUDOS)
Dª María Casas	1 y 2	Murallón: ochenta y ocho	88	´´	´´	´´	88	8	740
Miguel Abrahams	3	Murallón: sesenta y cinco	65	1	Callejón inmediato: veintinueve 29	65	´´	´´	´´
				C	Murallón: treinta y seis 36				
D. Felipe del Pan	4	Id.: setenta	70	2	Callejón izquierda: cuarenta y ocho 48	48	22	8	176
Limón Zolentino	5	Id. Cincuenta y seis	56	´´	´´	´´	56	8	448
D. Ramón Cadorniga	6	Id. Doscientos setenta 270	1662	3	Callejón dicha: seiscientos treinta y siete 637	1471		8	1528
	7	Calle Echagüe: novecientos ochenta 980		4	Id.: cuarenta y nueve 49		126		
	8	Calle Lara: cuatrocientos diecinueve 419		5	Id.espalda: trescientos ochenta y ocho 388		65		
				6	Id.: trescientos noventa y siete 397				
D. José Gonzales y Castro	9	Murallón: ciento y cinco 105	465				63	8	504
	10	Calle de Lara: ciento sesenta y cinco 165		7	Callejón inmediato: ciento ochenta y cuatro 184	402			
	11	Id. de Echagüe: diez y ocho 18		8	Otro callejón: ciento cincuenta y dos 152				
	12	Id. de Lara: ciento setenta y siete 177		9	Id. Id.: sesenta y seis 66				
D. Rafael Zaragoza	13	Murallón: treinta y cinco 35	56	10	Callejón inmediato: cincuenta y tres	53	3	8	24
	14	Calle de Lara: veinte y una 21							
Juan Gutierrez	15	Murallón y Lara: doscientos noventa y seis	296	G	Calle antigua Lavezares: ciento cincuenta y dos 152	296	´´	´´	´´
				143	Antigua pescadería: ciento cuarenta y cuatro 144				
Juan Rodriguez	16	Id. Ciento ochenta y una 181	488	H	Calle antigua Lavezares:	488	´´	´´	´´

	17	Calle de Vives: ciento diez 110			cuatrocientos ochenta y ocho				
	18	Id. Id. Ciento noventa y siete							
Miguel Abrahams	19	Murallón: sesenta y seis 66	113	11	Callejón inmediato: ochenta y tres 83	113	,,	,,	,,
	20	Calle de Vives: cuarenta y siete 47		12	Id. Espalda: treinta 30				
Esteban Mendoza	21	Id. de Id. Noventa	90	Y	Calle Vives: noventa	90	,,	,,	,,
Dª Margarita Rojas	22	Murallón: ciento diez 110	255				82	8	656
	23	Calle del pan: setenta y siete 77		13	Callejón: noventa y tres 93	173			
	24	Calle de Vives: veintisiete 27		14	Otro callejón: cuarenta 40				
	25	Calle de Vives: dieciseis 16		15	Otro callejón: cuarenta 40				
	26	Calle de San Nicolás: veinticinco 25							
Dominga Ponko	27	Murallón: treinta 30	87	16	Frente San Nicolás: ochenta y siete	87	,,	,,	,,
	28	Calle del Pan: cincuenta y siete 57							
Marcelino Gaddula	29	Murallón y del Pan: setenta	60	17	Id. Id.: sesenta	60	,,	,,	,,
Geronimo Gonzalez	30	Calle del Pan: sesenta	60	18	Id. Id.: sesenta	60	,,	,,	,,
Agustin de Jesus	31	Id. de Id. Cincuenta y seis 56	132	19	Id. Id.: ciento treinta y dos	132	,,	,,	,,
	32	Id. de Echagüe: setenta y seis 76							
Cayetano Reyes	33	Calle de San Nicolás: ciento cuatro	104	20	Calle de Vives: noventa y nueve	99	5	6	30
Antonio Marcelo	33 1/2	Calle de Vives: cuarenta y ocho	48	R	Calle de Vives: cuarenta y ocho	48	,,	,,	,,
Pedro Coll	34	Calle de Echagüe: cuarenta y cinco	45	21	Calle de San Nicolás: treinta y siete	37	8	6	48
Mateo ¿Munji?	38	Calle de Echagüe: cincuenta y cuatro	54	24	Calle de Lav&.playa: cincuenta y cuatro	54	,,	,,	,,
Gregorio de San Luis	35	Calle de Echagüe: doscientos cuatro	204	22	Id. Antª Lav&: doscientos cuatro	204	,,	,,	,,
Mateo Nava	36	Id. Id. Ciento cincuenta	150	23	Callejón Calle Antª Lav&: ciento doce	112	38	3	114
D. Miguel Abrahams	37	Id. Id. Cuarenta y tres	43	F	Interior del murallón junto a su solar: cuarenta y tres	43	,,	,,	,,
Josefa Francisca Pineda	39	Id. Id. Lav& y Echagüe: quinientos quince	515	25	Callejones inmediatos: ciento sesenta y cuatro 164	515	,,	,,	,,
				C	Calle antigua de Lav&: doscientos 200				
				D	Playa al lado de la Calle Echagüe: ciento				

					cincuenta y uno 151				
Trinidad Morello	40	Id. Lav&: doscientos cuarenta y cuatro	244	26	Callejón: ciento cincuenta y cinco 155	244	´´	´´	´´
				26 1/2	Playa Lav&: ochenta y nueve 89				
D. Bernardino Ygcasañas	41	Id. Id. Noventa y nueve 99	189	27	Calle de Vives: noventa y nueve 99	189	´´	´´	´´
	42	Id. de vives: noventa 90		28	Calle de vives: noventa 90				
León Valdés	A	Calle de Echagüe y antigua de San Nicolás: cuarenta y seis	46	B	Calle del mismo San Nicolás: cuarenta y seis	46	´´	´´	´´
Agapito Francisco	15 1/2	Murallón: ochenta y ocho	88	163	Calle antigua del Lav&: ochenta y ocho	88	´´	´´	´´
					TOTAL	**5217**	**556**	´´	**4263**
Manila, 5 de diciembre 1866 (FIRMAS)									

D. List of streets per suburb and the number of existing petroleum and oil lamps by the year 1882

Relación detallada de las calles y plazas en que están colocados los faroles del alumbrado público, Arrabal de Binondo, 10 de marzo de 1882.		
Calle	**Faroles de Petróleo**	**Faroles de Aceite**
Calle de Santo Cristo (desde el Mercado de la Divisoria de San Fernando)	26	
Calle de Mercado de la Divisoria para el río		3
Plaza del Conde		2
Calle de Barcelona		2
Paseo del Príncipe		19
Calle de Madrid		13
Calle de Camba		12
Calle de Asunción		8
Calle de Caballero		10
Calle de Elcano		14
Calle de Ilang-ilang		8
Calle de San Fernando	25	
Calle de Urbiztondo		9
Calle de Barraca		10
Calle de Numancia		6
Calle de Jaboneros	15	
Calle de Peñaranda		2
Calle de Alcaicería		2
Calle de San Nicolás		6
Calle de Lavezares		6
Calle Tribunal de Mestizos		2
Calle de Fundidor		5
Calle de Fumadores		1
Muelle de San Fernando	14	
Muelle de Barraca		6
Puente de Binondo	1	
Calle de Prensas		3
Calle de Varadero		3
TOTAL	**81**	**151**

Relación detallada de las calles y plazas en que están colocados los faroles del alumbrado público, Arrabal de Sta. Cruz, 10 de marzo de 1882.		
Calle	**Faroles de Petróleo**	**Faroles de Aceite**
Puente de San Miguel		2
Salón de Juntas	17	

Plaza de Goiti	10	9
Mitad del Puente de Visita	1	
Plaza de Sta. Cruz	16	
Puente de Carriedo	2	
Carriedo	9	
Enrile		4
Puente de Urejola		2
Bustos		5
Alcalá		7
Almirante		2
Puente de Lacoste	1	
Lacoste		13
Tetuán		9
Obando		6
Misericordia		11
Mitad del Puente de San Agustín		2
Gándara		3
Mitad del Puente de Oraa	2	
Puente de San Pedro		1
San Pedro hasta a la casa no. 20		16
Curtidores		3
Dalumbayan		21
Salcedo		23
Centeno		3
San Roque		14
Platerías		5
Noria hasta a la casa no. 9		4
Crespo hasta a la casa no. 12		3
Echagüe hasta al ángulo de Villalobos		10
Isla del Romero		9
Oroxio? Hasta a salida del de P. Ducos		3
Trinidad		9
Banquillo		7
Quiotan		16
Mitad del Puente de Iris		1
Calzada de Bilibid		14
Puente de Concordia		2
Calzada de Paz		14
Mitad del Puente de Chinos		1
Dolores		6
Espeleta		6
TOTAL	**58**	**266**

Relación detallada de las calles y plazas en que están colocados los faroles del alumbrado público, Arrabal de San Miguel, 10 de marzo de 1882.

Calle	Faroles de Petróleo	Faroles de Aceite

Puente de los Quinta	2	
Puente de Balicbalic?		2
Puente de Nova?	2	
Puente de San Rafael	2	
Puente de ¿?		2
Calzada de San Rafael	18	
Calzada Real hasta la Iglesia	18	
Calzada Sta. Lucía	42	
Calzada de ¿?	37	
TOTAL	**119**	**4**

Relación detallada de las calles y plazas en que están colocados los faroles del alumbrado público, Arrabal de Sampaloc, 10 de marzo de 1882.		
Calle	**Faroles de Petróleo**	**Faroles de Aceite**
Calzada Real o de Alin desde la casa del Sr. Matti	52	
Puente de Carriedo	11	
Puente de Manpalaca	2	
Puente de Avilés		2
TOTAL	**65**	**2**

Relación detallada de las calles y plazas en que están colocados los faroles del alumbrado público, Arrabal de Sampaloc, 10 de marzo de 1882.		
Calle	**Faroles de Petróleo**	**Faroles de Aceite**
Calzada de San Sebastián	24	
Plaza de Sta. Ana desde el Puente de San Sebastián	18	
Calzada del Iris		30
Paseo de Quiapo	6	
Calle de Villalobos	5	
Elizondo	4	
Gunao	3	
San Gerónimo	3	5
Norzagaray	3	1
Globo de Oro	1	
Plaza Blanco		2
Barbosa	5	3
Escaldo		2
Concepción (hasta la calle de la Noria)	4	6
Noria hasta la calle de la Palma		4
Sta. Rosa (hasta la calle de Noria)	6	7
San Isidro (hasta la calle Noria)		3
Palma		7
Echagüe desde Villalobos	12	
Basan		2

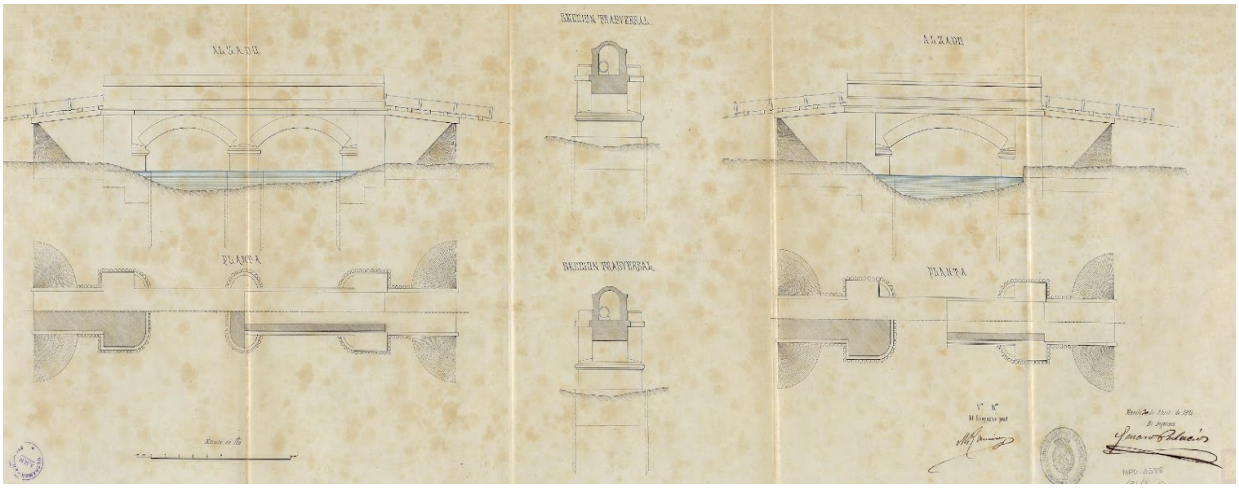
Ozcarín		2
Ducos		
Crespo desde el no. 12	12	3
Carriedo desde el no. 21	4	
Plaza de Miranda	5	
Mendoza hasta el Puente de San Blas		1
Limasaua		
Retiros		
Carcer	2	
Bilibid desde San Sebastián al final		
Marquez desde la plaza de Sta. Ana al puente	2	
Tanduay, desde el Puente de Constancia al de Novaliches	4	23
Balmes		
Arlegui	2	
TOTAL	**125**	**101**

Relación detallada de las calles y plazas en que están colocados los faroles del alumbrado público, Arrabal de Sampaloc, 10 de marzo de 1882.

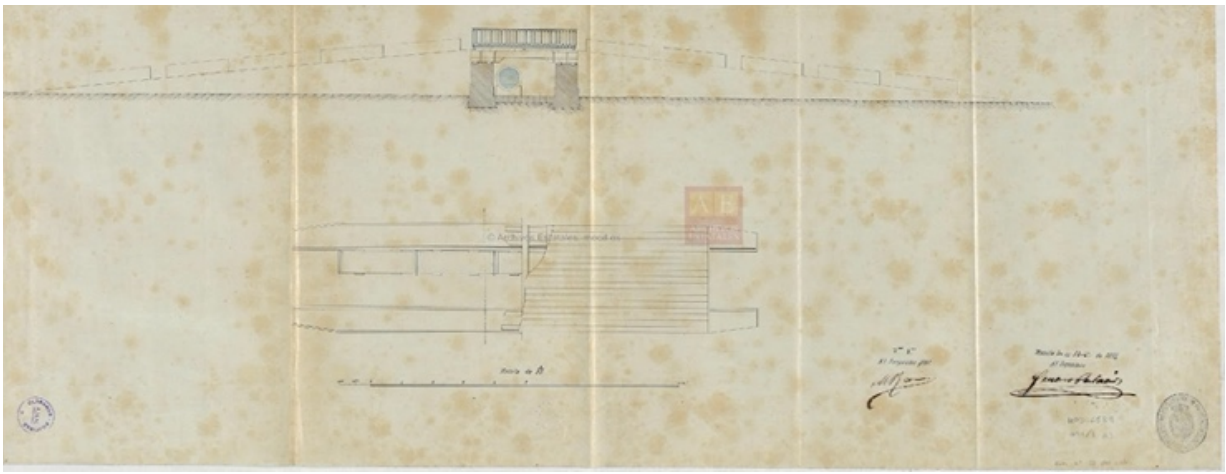
Calle	Faroles de Petróleo	Faroles de Aceite
Puente de Prim		2
Calzada de la Gran Divisoria	15	3
Calzada de Soler		11
Calzada de Meisic		5
Paseo de Azcárraga		58
Calle del Mercado de la Divisoria para Ilaya		8
Calle del Principal que hace prolongación de Sto. Cristo frente del Teatro de Tondo	7	
Calle de Ilaya		7
Calle de Lemery		20
Calle de Candelaria		4
Calle de Pescadores		2
TOTAL	**22**	**120**

Appendix for Chapter 5

1. Appendix, Chapter 5, A
Sample of other plans for bridges connecting the pipelines from the San Mateo/Marikina river to the capital.



S*ource:* AHN, Ultramar, MPD. 4588, Grupo de pontones y un puente para el estero de Sampaloc, 1874.



Source: AHN, Ultramar, MPD. 4589, Proyecto de conducción de aguas a Manila: Distribución: Paso superior para las tuberías descubiertas.

2. Appendix, Chapter 5, B
Distribution of pipes, per pipe, installed per suburb.
Source: AHN, Ultramar, 491, Exp. 4.

	0.65	0.55	0.46	0.40	0.34	0.30	0.25	0.22	0.20	0.16	0.12	0.08	
										110	415	760	
San Miguel	1, 175	425		880			140			260	730	410	
Quiapo		575					45		150		1, 005	670	
Santa Cruz		50	495		310		520			340	1, 600		
San Jose					350				740	240	675		
Binondo					515	730	340		300	1, 540	1, 190		
Tondo										550	355	245	
Intramuros									1, 125		1, 975	1, 260	
Ermita					1, 175	1, 680							
Malate								560		560			
Paco										885	285		

Table 1: *Estado que manifiesta las longitudes de tuberías de cada diámetro que entran en la distribución.*

3. Appendix, Chapter 5, C
List of Paying Households with Direct Water Access
Source: AF-BTNT-CCHS-CSIC, Abastecimiento de Agua, Microfilm Roll, 1771

RELACIÓN de los recibos del Impuesto sobre frentes de fincas rústicas y urbanas del Distrito de TONDO correspondiente al año de 1896. 97 entregados al cobrador Amancio Escobar				
NÚMERO DE LOS RECIBOS	NOMBRES	CALLE	PARCIAL	TOTAL
141	Margarita López	Tabora	10,28	
137	"	¿?	30,08	40,36
79	Pedro Ampua	Antonio Rocha	42,68	
92	"	¿?	9,01	
93	"	¿?	13,42	65,11
33	Compañía Tabaco	Lemery	44,57	
34	"	"	41,91	
35	"	"	38,14	124,62

14	Lucio Ambrosio	P. Clavel	13,96	
56	"	P. Rada	9,72	
184	"	Ylaya	10,18	33,86
25	Monte de Piedad	Santa Elena	10,9	
72	"	Meysic	4,58	15,48
289	Vicente Lonoso	Aceiteros	51,01	
5	"	Olivares	38,75	
6	"	"	7	
226	V. Economía	Encarnación	3,58	
207	"	"	16,68	
285	"	"	8,96	
286	"	"	8,5	134,48
251	María Ubaldo	Aceiteros	9,43	
148	"	Tabora	12,48	21,91
252	Lucio Anjuico	Aceiteros	14,9	
253	"	"	5,98	
144	"	Tabora	10,4	
19	Mariano Alonso	Lemery	7,86	
157	"	¿?	25,46	64,85
63	Hilario Limco	Moriones	1,87	
65	"	P. Rada	8,84	10,71
70	Nazareno Cristante	Lemery	5,24	
140	"	P. Azcarraga	3,82	
69	"	Lemery	8,99	18,05
141	Tomasa Damian	Azcarraga	15,09	
64	"	P. Rada	7,76	
307	"	Lafuente	9,51	32,36
17	Lorenzo del Rio	Olavide	14,3	
19	"	"	26,9	
9	"	¿?	14,92	
20	"	Magallanes	5,6	61,72
38	Catalino Boncan	Lemery	14,76	
248	"	Aceiteros	8,65	
250	"	"	9,18	
81	"	Santa Elena	14,24	
30	"	"	8,55	55,38
70	Lamberto Abellana	Moriones	9,15	
216	"	Raja Matanda	22,32	
347	"	P. Herrera	10,6	
356	"	"	16,44	
56	"	Lemery	20,05	
360	"	P. Herrera	9,08	87,64
88	Tiburcio Luistro	Lemery	18,48	
130	"	Azcarraga	69,32	

94	"	Soler	21,45	
97	"	"	12,95	
100	"	"	7,23	129,43
54	Clemente Manotoc	Lemery	6,6	
267	"	Aceiteros	12	
268	"	"	6,95	
35	"	P. Rada	13,24	
51	Petrona Manotoc	P. Rada	6,48	
308	Clemente Manotoc	Salinas	4,5	49,77
68	Yldefonso Tambunting	Lemery	7,67	
73	"	"	20,63	
72	"	"	12,45	
84	"	"	33,95	
89	"	Azcarraga	37,52	
423	"	Francisco Leon	34,2	
155	"	Raja Matanda	21,01	
156	"	"	37,34	
190	"	Ylaya	3,41	
191	"	"	9,56	
225	"	Raja Matanda	9,32	227,06
13	Jose Lerma	Lemery	6,6	
14	"	"	17,18	
15	"	"	11,95	
97	"	Azcarraga	8,8	
98	"	"	19,91	
13	"	Clavel	3,3	
14	"	"	3,5	
8	Jose Lerma	Gabriel Rivera	5,08	
426	"	Lemery	34,2	
52	Pastor Lontoc	Lemery	11,77	122,28
3	Rosa Morales	Lemery	12,29	
4	"	"	10,17	
21	"	"	20,44	
183	Aniceto Morales	Ylaya	2,97	
211	Hermanos Morales	"	5,8	
249	Jose Morales	Aceiteros	9,7	
345	Rosa Morales	P. Herrera	40,36	101,73
17	Julian ¿?	Lemery	63,22	
18	"	"	8,24	
20	"	"	5,17	
357	"	P. Herrera	26,4	
308	"	Lafuente	15,56	118,59
294	Jose Zaragoza	Salinas	2,94	
55	"	Lemery	44,06	

145	"	P. Azcarraga	14,42	
220	"	Raja Matanda	16,8	78,22
291	Miguel Montecampo	Aceiteros	7,31	
292	"	"	5,22	
7	"	Clavel	5,7	
83	"	P. Concepcion	6,38	
138	"	Plaza Lara	20,38	
244	"	Encarnacion	17,4	
245	"	"	4,14	
248	"	"	5,52	
249	"	"	1,7	
250	"	"	4,72	
232	Miguel Montecampo	Encarnacion	4,44	
300	"	Salinas	3	
337	Carlos Palanca	Folgueras	23,6	85,91
430	"	¿?	10,94	34,54
177	Teodoro Sonico	Ylaya	9,54	
447	"	¿?	8,18	17,72
154	Pedro Robledo	¿?	12,45	
158	"	"	8,5	
162	"	"	4,13	
163	"	"	18,89	
80	"	Soler	7,05	
83	"	"	27,82	
92	"	"	3,45	
93	"	"	32,73	
70	"	Felipe 2º	24	
404	"	P. Alvarado	23,4	162,42
2	Bernardino Lechauco	Lemery	23,04	
74	Timotea Lechauco	"	11,2	
75	"	"	26,89	
127	Cornelia Lechauco	Azcarraga	31,46	
128	"	"	23,29	
238	Crisanto Lechauco	Leon 13	8,52	
282	Cornelia Lechauco	Aceiteros	9,68	
288	Crisanto Lechauco	"	5,88	
4	Crisanto Lechauco	Clavel	5,4	
18	"	"	18,15	
23	Bernardino Lechauco	Santa Elena	10,12	
26	Eugenia Lechauco	¿?	4,58	
29	"	"	6,24	
32	Crisanto Lechauco	P. Ortega	9,36	
232	Eugenia Lechauco	Encarnacion	5,98	
270	Crisanto Lechauco	Salinas	17,28	

414	Timotea Lechauco	Francisco Leon	39,42	
457	Crisanto Lechauco	Bilbao	4,558	
422	Timotea Lechauco	P. Francisco Leon	6,7	267,75
146	Benigno Tuason	P. Azcarraga	6,86	
148	"	"	4,18	
22	"	¿?	9,48	
75	"	"	10,77	
76	"	"	3,44	
234	"	Encarnacion	2,4	
237	"	"	2,66	
261	"	"	6,56	
537	Benigno Tuason	Soledad	5,12	
462	Josefa Tuason	Bilbao	8,86	
486	"	Pescadores	7,74	
47	"	P. Rada	11,98	
149	¿? Tuason	Azcarraga	5,19	
315	Vicente Tuason	Folgueras	5,78	91,02
146	Genoveva Rosario	Tabora	24,12	
24	"	Santa Elena	43,12	
263	"	Aceiteros	10,67	
194	"	Ylaya	11,77	89,68
23	Nicolas Rosario	Lemery	14,93	
125	"	Azcarraga	15,07	
412	"	P. Francisco Leon	24,02	
160	"	R. ¿?	36,13	
166	"	"	23,56	
66	"	Moriones	15,37	129,08
67	Catalina Ramos	P. Rada	7,32	
312	"	Lafuente	20,9	
203	"	Ylaya	6,57	
201	"	"	8,96	
143	"	P. Azcarraga	10,34	
142	"	"	10,62	64,71
305	Marciano Ramos	Lafuente	7,48	
302	"	"	15,4	
206	"	Aceiteros	10,01	
51	"	Lemery	11,05	
99	"	Azcarraga	9,83	
181	"	Ylaya	12,65	66,42
180	Mariano Ocampo	Ylaya	34,65	
196	"	"	5,22	
197	"	"	6,4	

205	"	"	5,25	
212	"	"	7,42	
213	"	"	12,6	71,54
86	Compañía Tranvias	Lemery	80,4	
171	Cirilo David	Ylaya	19,25	
67	Braulio Mariano	Lemery	3,79	
161	Joaquin ¿?	¿?	30,99	134,43
206	Alejandro Grande	Ylaya	19,19	
129	Julian Lao	P. Azcarraga	23,98	
179	Lucio Angeles	Ylaya	7,37	
297	Dumas Genaro	Aceiteros	23,18	
49	Maria Richar	Lemery	9,25	82,97
204	Felipe ¿?	Ylaya	14,2	
150	Mauricio Felix	Azcarraga	12,4	
153	Vicente Leyva	¿?	7,2	
192	Benito Aramburu	Ylaya	21,84	
31	Telesforo Chuanco	Santa Elena	4,94	60,58
28	Antonio Valencia	Lemery	18,39	
32	Juan Oreta	"	3,6	
5	Rafael Paras	"	18,09	
6	"	"	7,15	
1	Raimundo Zamora	"	15,19	62,42
94	¿?	Azcarraga	108,35	
8	Herminio ¿?	Lemery	10,83	
289	Apolonia Carro	Salinas	8,36	
43	Emilio David	Lemery	20,79	
30	Calixto Reyes	"	21,62	169,95
27	Luisa Francisco	"	51,97	
96	Mariano Velasco	Azcarraga	9,05	
199	Ygnacio L. Yap.	Ylaya	9,29	
204	"	"	6,6	
304	Vicenta L. Reyes	Lafuente	6,44	
			Suma Anterior	3197
Tomas Alcantara		P. Rada		13,18
Alfonso Maceras		P. Azcarraga		26,84
Lucio Rivas		"		8,09
Lucio de las Rivas		Lafuente		11,16
Felipe Rivera		"		19,44
Pedro Rivera		Antonio Rivera		4,76
Miguel Montecampo		Aceiteros		20,24
			TOTAL	3300,87

Manila, 12 de Agosto de 1897
El cobrador
Damaso Escobar

ERMITA				
Nº RECIBO	NOMBRES	CALLE	PARCIAL	TOTAL
141	Abelina Ayllon	Real	5,61	
137	Antonio Rocha	"	8,91	
155	Mariano Arenas	"	10,59	
164	Pilar de Uidobro	"	23,98	
165	Pilar Perez	"	7,9	
166	Justo Peña	"	11,27	
174	Diega San Jose	"	7,86	
178	Maria Santos	"	8,46	
187	Silvestre L. del Arroyaga	"	12,06	
188	Antonio Nabalan	"	16,17	
198	Antonio Guirante	San Luis	10,67	
199	Zolipa Encarnacion	"	10,56	
204	Valentina viuda de Garchitorena		18,23	
205	"		3,96	
213	Antonio Rocha		14,43	170,66
MALATE				
204	Enrigue de la Vega	Herran	24,22	
205	"	"	48,4	
98	Silvestre L. de Arroyave	Nueva	10,03	
99	Eusebio Asuncion	"	9,35	
14	Jose Medina	Real	6,98	98,98
(FIRMA) PRECIO			TOTAL	269,64

SAN MIGUEL			
Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
1	Doña Josefa Cembrano	Abril a junio 97	10,62
2	Concepcion Delgado		9,1
3	Jose Clavet		5,86
4	Pedro P. Roxas		12,56
5	"		9,55
6	Natalia P. Casal		10,73

7	Pedro E. Co-Chayco		4,98
8	Mariano de Ocampo		6,33
9	Dionisio de las Cajigas		7,45
10	Lorenzo Reyes C. Tongco		6
11	Cesar A. y Castellano		6,55
12	Pedro P. Roxas		4,53
13	Fidel Rivera		4,71
14	Evaristo Batlle		7,02
15	Benito Legarda		5,46
16	"		6
17	"		7,85
18	"		7,77
19	Sres. Ynchauste y Compañía		5,5
20	Francisco L. Roxas		8
21	Henry R. Coombs		13,36
22	Jose Clavet		7,07
23	Mariano Buenaventura		6,58
24	Maria de Ycaza		5,27
25	Felix Gonzales		5
26	Maria de Ycaza		5,95
28	Mariano Tuason		5,1
29	Juan Sanz y Sanz		5,36
30	Maria de Ycaza		7,05
31	Josefa Cembrano		4,8
32	Telesforo Chuidian		7,9
33	Escolastica Pura		4,1
34	Dª Juliana Trinidad		4,98
35	Fidel Rivera		4,71
37	Vicenta Reyes		4,71
38	Emilio Gago		4,36
39	Jose M. Lacalle		6,07
40	Vicente Fernandez		5,36
41	Gregorio Granados		5
42	Jose Hsensi Sy-Sieng-Lu		5
43	Vicente Fernandez		7
44	"		5,35
26	Salvador Chofre		4,82
		SUMA	**224,11**

SANTA CRUZ			
Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
1	Joaquin Tan-Ancgco	Abril a junio 97	7,46

2	Francisco Godinez		5,82
3	Simon Schucer		5,46
4	Mariano G. Galian		6,55
5	Sabas del Rosario		4,78
6	Maria ¿?		5,35
7	Juan Mapua		5,16
8	Cirilo David		4,73
9	Jose J. de Ynchauste		6,53
10	"		8,02
11	Silvestra Zarate y Dolores		4,91
12	Sabas del Rosario		4,82
13	Jose Villeta		5,16
14	Maria Paz Puatu		4,18
15	Bernardino Revilla		5,55
16	Cirila Ochangco de Salterio		6,37
17	Tomas Tuason		5,27
18	Dª Marta Zantoio y Santos		4,18
19	Juan Generoso		4,55
20	Tito del Rosario		5
21	Pelagia Velasques		6,46
22	Leon Reyes		4,55
23	Felix Javier		5,27
24	Tomas G. del Rosario		5,18
25	Pedry Sy-Grua		5,36
26	Petrona Manuel		4,26
27	Enrique Mendiola		11,73
28	Eugenia R. de Reyes		4,91
29	Armando Camps		4,91
30	Aurea del Castillo		4,18
31	Gregorio Borja		5,27
32	Ysidro de la Rama		5,33
33	Alvaro Torres		4,98
34	Francisco Roman		4,73
35	Vicenta Leyba		4,62
36	Castro Lopez Brea		4,91
37	Francisca de Liza		4,36
38	Tomas G. del Rosario		5
39	Manuel Bautista		5,46
40	Sotero David		4,36
41	Jose Javier		4,71
42	Carlos Garcia		4,55
43	Florentino Torres		6,1
44	Esteban Alonso		4,33
45	Maria Vera Ygnacio		5,1

46	Valeriana Valdesco		9,25
72	Jose Gamero		4,77
47	D. Valeriano Valdesco		5,55
48	Jose Crispulo Reyes		4,55
49	Jose A. Paterno		5
50	Jose G. Rocha		4,45
51	Victoriana Leoquingu		4,27
52	Bernalda Ygelma		9,87
53	Cirilo de Guzman		4,36
54	Severino Reyes		4,36
55	Teodoro de los Reyes		5
56	Francisco Reyes		7,17
		SUMA	**254,49**

TONDO

Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
1	D. Nazario Nicasio	Abril a junio 97	8,53
2	Teodora S. Chua Nangu		4,9
3	Eugenia Lichauer		4,18
4	Tomas Cabangis		4,55
5	Vicente Santos		4,55
6	Marcela Zarate		5,38
7	Luis Jerez de Tagle		4,91
8	¿? Zialeita		4,65
9	Pedro Robledo de Gonzales		4,82
10	Manuel de Abreu		5,45
11	Marciana Ramirez		6,07
12	Santiago Calueto		5,06
13	Juan Vargas		8,85
14	Jose Arriola		5
15	Estanislao Legaspi		6,18
16	Catalina Ramirez		4,18
17	Mariano Jacinto		5,73
18	Casimira Antonio		4,73
		SUMA	**97,72**

Relación de los recibos de aguas por caño libre, de los meses de Abril a Junio de 1897, entregados al Cobrador Pedro Villanueva para su cobro.

ERMITA

Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**

1	Dª Felisa Gonales viuda de Casademunt	Abril a junio 97	7,28
2	Evaristo Batlle		7,28
3	Armando Villemeu		7,51
4	Joaquin Maria de Elizalde		15,91
5	Luis M. Yllescas		6,45
6	Pantaleona Rivera		14,01
7	Emilio Moreta		4,86
8	Rafael Perez		8,7
9	Manuel Penado		9,3
10	Maria Salamanca		4,9
11	Fernando Amrich		5,46
12	Emilia Yparraguirre		5,78
13	Jose P. Fernandez		5,7
14	Jose Yrigonas		4,62
15	Valentina Cajigal		5,67
16	Maria del Rosario		4,91
17	Valentina Cajigal		5,18
18	Pedro A. Paterno		4,18
19	Maximiliano Rosales		4,91
20	Luis M. Yllescas		5
21	Federico G. Joboli		9,02
22	Antonio N. de Aldana		6,07
23	Vicente Guyugan		5,46
24	Luis Ruiz Huidobro		11,55
25	Jose Maria Bren		5,3
26	Jose Maria Alarquez		5,1
27	Joaquin M. Ynchausti		10,35
28	Maximiliano Rosales		4,91
29	Dionisio Trinidad por D. Jose Maria Perez		5,73
30	Crisanto Reyes		4,18
31	Otto Jecheres		5,1
32	Pilar Bartoluci de Huidobro		5,18
33	Avelina Ayllon		4,9
34	Telesforo Chuidian		5,45
35	Luis de Leon		4,53
36	Hernando ¿?		5,18
37	Josefa Caro y Mora		8,11
38	M. Henrry Consul de Belgica		5,8
39	Agustin Palet y Roca		5,18
40	Telesforo Chuidian		5,18
41	Antonio Garcia		5,25
42	Vicenta O. de Pardel		7,11
43	Luisa Peña		15,51

44	Vicente Barrena		5,08
45	? Meyer		4,38
46	Maria de los Angeles		5,36
47	Armando Villemeu		5
48	Rafael Ynchausti		8,06
49	Juan A. Soler		4,82
50	Felipa Silvestre		4,08
51	Eulalia Aguilar		5,63
52	Alejandro Grande		4,62
53	Valentina Cajigal		5,27
54	"		5,27
55	Dª Felisa Corrales viuda de Casademunt		4,8
56	Rafael Grame		5,36
57	M. Henrry Consul Brasil		7,26
58	D. Telesforo Chuidian		6,83
59	Maximiano Rosales		4,73
60	Maria Saracho		5,1
		SUMA	**379,1**

MALATE

Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
1	Francisca Roldan	Abril a junio 97	4,55
2	Maria Ypanages		10,3
3	Encarnacion de Elizalde		11,32
4	Zoilo Yañez Aldecoa		6,53
5	Alexander S. Macloyd		6,42
6	Bonifacio Alonso		5,52
7	Maximiano Rosales		4,91
8	Josefa Barretto		8,08
9	Cayetano Arellano		5,2
10	Francisca Roldan		4,97
11	Manuel Barredo		5
12	Manuela de la Cruz		6,1
13	Segundo Javier		4,18
14	Jose de Medina		5,1
15	Juan F. Macloyd		4,53
16	Segundo Javier		4,91
17	Modesto Cortabitante		5,05
18	Maximiano Rosales		8,37
19	Faustino Prospero		4,8
20	Silvestre Lopez de Aroyave		10,41

21	Maximiano Rosales		4,18
22	Josefa Cembrano		5,1
23	Agustin Palet y Roca		5,18
24	Luis S. Echalure		4,73
25	Maximiano Rosales		4,91
26	Zoilo Yañez Aldecoa		5,7
27	Modesto Cortabitante		4,53
28	Martin Javier		4,62
29	Francisco Fernandez Bernal		5,1
30	Serviliana L. de Somosa		5,15
31	Cayetano Arellano		5
32	Teodorica Alarde		5
33	Fabiana Hernandez		10,37
34	Lucio Eguia		5,93
		SUMA	**156,05**

TROZO			
Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
1	Dª Saturnina Zalazar de Abreu	Abril a junio 97	4,9
2	"		4,9
3	Domingo del Rosario		5,36
4	Juana Clemente		4,21
5	Maxima Fernandez		4,65
6	Maria J. Ycasiano		5,91
7	Marcelo Boncan		4,98
8	Juan Alcantara		5,36
9	Rosauro Cortes		5,91
10	Narcisa Reyes		5,7
11	Yldefonso Tambunting		5,51
12	Mariano del Rosario		5
13	Chino Pablo Ortega		6,37
14	Vicente Michel		8,7
15	Jose Varela y Calderon		5,1
		SUMA	**82,56**

SAN FERNANDO DE DILAO			
Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
1	Dª Dolores Sanchez	Abril a junio 97	6,91
2	Pilar Bertoluci		6,15

3	Joaquin Morelló		5,7
4	Miguel Medina y Garcia		6,01
5	Anacleto del Rosario		9,46
6	Felipa Encarnacion		6,1
7	Vicenta Ortiz de Pardel		5,6
8	Daniel Ortega y Ortega		5,76
9	Santiago Dominguez		5,11
10	Luis Perez		4,8
11	"		4,7
12	Raymundo Melliza		6
13	Rafael Perez		10,2
14	Dolores Ycasella		5,38
15	Santiago Dominguez		10,01
16	Saturnino Limco		4,62
17	Santiago Dominguez		6,18
18	Antonio Reyes Borja		4,95
19	Rafael Perez		5,1
20	Maximiliano M. Nelozo		7,07
21	Teodoro Beech		11,37
22	Apolonia Remigio		4,62
23	Jose A. Acebedo		6,82
24	Jose Ybaceta		5,55
25	Antonio Correa		12
26	Manuel Perez hijo		5,75
27	Pablo Antonio Martinez		5,86
61	Margarita Asuncion		2,92
RESUMEN			
		60 Recibos Ermita	379,1
		34 id. Malate	201,8
		15 id. Tondo	82,72
		28 id Dilao	181,46
	134 Recibos	TOTAL	845,08

Resumen de los recibos de Aguas de Carriedo por contador de Abril a junio 1897 entregados al cobrador Pedro Villanueva para su cobro

NOMBRES	MESES	PARCIAL	TOTAL
La Remonta de Artillería	Abril	14,88	
"	Mayo	14,53	
"	Junio	13,7	43,11
El Parque de Ingenieros	Abril	3,76	

"	Mayo	3,84	
"	Junio	3,48	11,08
Excmo. Sr. D. Lope Gisbert	Abril	4,4	
"	Mayo	5,86	
"	Junio	5,76	16,02
D. Joaquin Sta Marina	Abril	4,36	
"	Mayo	4,64	
"	Junio	4,88	13,88
La Compañía General de Tabacos	Abril	7,75	
"	Mayo	7,6	
"	Junio	17,37	32,72
Comandancia de Yngenieros de esta plaza	Abril	1,76	
"	Mayo	2,12	
"	Junio	5	8,88
"	Abril	1,2	
"	Mayo	1,24	
"	Junio	2,08	4,52
"	Abril	2,12	
"	Mayo	1,24	
"	Junio	1,2	4,56
"	Abril	4,08	
"	Mayo	3,24	
"	Junio	3,96	11,28
El Estado: Hospital Militar	Abril	52,47	
"	Mayo	56,62	
"	Junio	79,87	188,96
Las Obras del Puerto	Abril a Junio		26,67
Manguera		Suma Anterior	361,68
D. Juan B. Goitia	Abril a Junio		240,51
Sres. Smith Bell y Compañía	"		5,7
D. Feliciano Balza	"		5,4
D. Antonio Trelles	"		1,3
D. Enrique de Soto	"		1,83
36 Recibos		SUMA	616,42

Manila, 23 de Agosto de 1897

Recibí

El Cobrador

Pedro Villanueva

Relación de los recibos de Aguas por Contador del 2º ¿? Entregados al Cobrador Juan Gonzales para su cobro				
Nº RECIBO	**NOMBRES**	**MESES**	**PARCIAL**	**TOTAL**
357	D. Luiso de Castro	Junio		0,4
316	Pedro Sanchez	Junio		2,96
345	Chino Po-Suco	Junio		1,2
309	Chino Vy-Aby	Mayo	0,56	
309	"	Junio	1,2	1,76
210	Dª Remigia Cagigal de Arteaga	Mayo	0,44	
210	"	Junio	1,2	1,64
305	Valeriano Valdesio	Abril	1,28	
305	"	Mayo	1,48	
305	"	Junio	1,2	3,96
302	Vicente Gonzales	Abril	1,84	
302	"	Mayo	1,84	
302	"	Junio	2,16	5,84
384	Tomas Tuason	Abril	9,11	
384	"	Mayo	8,23	
384	"	Junio	4,64	21,98
279	Severino Reyes	Abril	3,16	
279	"	Mayo	2,12	
279	"	Junio	2,4	7,68
275	Silvino Mapua	Abril	2,08	
275	"	Mayo	1,84	
275	"	Junio	1,84	5,76
274	Simona Victoria	Abril	2,32	
274	"	Mayo	2,44	
274	"	Junio	2,24	7
255	Pedro Gruet	Abril	3,36	
255	"	Mayo	3,12	
255	"	Junio	2,96	9,44
254	"	Abril	1,8	
254	"	Mayo	1,56	
254	"	Junio	1,36	4,72

(FALTAN DATOS)				
			Suma Ant.	309,19
6	D. Andres A. del Rosario	Abril a Junio		6,08
2	Albino Goyenechea	"		5,2
1	"	"		11,84
85 Recibos			**SUMA**	**332,31**
Bocas de incendio				
81	Dª Vicenta Hernandez	Julio 96 a Junio 97	1	
82	Francisco Reyes	"	1	
86	José Zaragoza	"	1	
90	Mariano Trio Trio	"	1	
152	Eulalio Carmelo	Agosto 96 a Junio 97	1	
110	José Rocha	Septiembre 96 a Junio 97	1	
120	Benito Legarda	Octubre 96 a Junio 97	1	
121	Cornelia Laochangco	"	1	
131	Manuel Roxas	Noviembre 96 a Junio 97	1	
151	Sabina P. viuda de Morong	Diciembre 96 a Junio 97	0,5	
148	Francisco Moreno	"	0,5	
12	Sabina P. Viuda de Morong	Enero 96 a Enero 97	1	
11	Baltazar Marty	"	2	13
13 Recibos				

RESUMEN

63	Recibos Intramuros	212,33
15	Recibos Bocas de incendios	14,5
85	Recibos Quiapo	332,31
13	Recibos Bocas de incendios	13
	TOTAL	**572,14**

Manila, 14 de Septiembre de 1897

Recibí

El Cobrador

J. G. Gonzalez

Relación de los recibos de Aguas por Contador de Abril a Junio de 1897 entregados al Cobrador Juan Gonzales para su cobro			
Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
200	D. Vicente J. de Lara	Abril a Junio 1897	10,2
285	Teodorico Cobarrubias	"	6,44
283	Teodoro Junico	"	6,2
282	Tiburcio Litiatco	"	15,28
281	Chino Sy Liocsuy	"	4,16
272	Dª Saturnina Salazar	"	4,16
269	Rafael Perez	"	20,68
268	Ricardo Aguado	"	5,2
262	Ramón Montañez	"	4,2
249	Pascual Ledesma	"	6,28
209	Maria Stos. Viuda de Lichauco	"	8,56
207	Mariano Velasco	"	29,69
199	Mariano Gil	"	5,88
177	Lucio Ongsiaco	"	5,02
168	Juan Goitia	"	3,64
159	Joaquin Santa Marina	"	5,96
158	Juan Craú	"	18,89
152	José Lerma	"	14,6
116	Florencio Baza	"	4,52
115	Flaviano Abreu	"	8,2
112	"	"	11,76
107	Feliciano Quiogue	"	5,64
91	La Empresa del Ferro Carril	"	56,5
78	Director de la Compañía General de los tranvías	"	24,15
66	Catalino Boncan	"	6,36
58	Cirilo de Peralta	"	3,76
42	Crispulo Feliciano	"	6,8
41	Cornelia Lao Changco	"	19,54
39	"	"	28,77
9	Agapito Yialcita	"	3,72
12	D. Antonio Caong	"	12,88
95 Recibos		**SUMA**	**367,96**
Bocas de incendio			

13	D. Pedro Sy-Luio	Enero 96 a Enero 1897	1
18	Mariano Velasco	Febrero 96 a Febrero 97	1
20	José Lerma	Marzo 96 a Marzo 97	2
23	Ricardo Aguado	"	1
31	Rufino Alcantara	"	1
38	Tiburcio Litiatco	Abril 96 a Abril 97	1
66	Escolastico Fernandez	Mayo 96 a Mayo 97	1
91	Lucio Ongsiaco	Julio 96 a Junio 97	1
130	Marciano Ramirez	Noviembre 96 a Junio 97	1
138	Felipe Villegas	"	1
137	Estanislao Legaspi	"	1
141	Rafael Jerez	"	2
?	Manuela Tarnate	Diciembre 96 a Junio 97	0,5
13 Recibos		**SUMA**	**14,5**
RESUMEN			
92 Recibos	Contador Tondo		1367,96
73 id	Bocas de incendios Id		14,5
165		**Total**	**1382,46**

Manila 20 de Diciembre del 1897
Recibe
El Cobrador
J. G. Gonzales

Relación de los recibos de Aguas por Contador correspondientes a los meses de Abril a Junio de 1897, entregados al Cobrador Pedro Villanueva para su Cobro.

318	D. Donato Mier	Abril a Junio 1897	18,04
113	Melecio Escobar	Mayo y Junio 1897	1,72
312	Ricardo Díaz	"	4,08
308	Valdomero Roca	Abril a Junio 1897	7,48
307	Ygnacio Laguna	"	2,88
306	Ysidra Sy Leo	"	3,6

301	Vicente J. de Lara	"	8,44
299	"	"	5,12
298	Vicente Lucinio	"	5,04
296	Vicente Sy Luia	"	6,36
295	"	"	6
294	Chino Ny Tian-quieng	"	4,96
292	Vicenta Roxas	"	5,24
287	¿? Torrecilla y García	"	9,2
286	Teodorico Cobarrubia	"	5,64
280	Sotera Bonamon	"	4,8
278	Severo Felix Villanueva	"	1,84
277	"	"	1,76
263	Ramon Tamar	"	24,81
259	Ramon Teulle	"	15,24
256	Petronila Encarnacion	"	7,16
253	Pedro Gruet	"	10,36
251	J. Paulino del Valle	"	9,52
274	Pablo Ortega	"	5,52
243	Pablo Reyes	"	4,92
236	Nicasio Navarro	Mayo y Junio 1897	2,6
234	"	Abril a Junio 1897	7,48
232	Nicolas del Rosario	"	12,72
231	Nicasio Veloso	"	12,4
229	Nicolas Ortega	"	14,88
227	Mario Lafita	"	4,6
225	Dª Maria Encarnacion Roxas	"	6,56
222	Manuel Castro	"	6,68
216	Maria Leocadio	"	13,16
213	Maria Anger	"	6,12
212	Manuel Perez Tan Yao	"	4,98
208	Mariano Velasco	"	5,36
206	"	"	35,98
204	Maximo Cortés	"	24,08
203	Mariano Luintap	"	5,92
201	Mariano de Ocampo	"	5,84
197	Modesta Pensanave	"	4,36
196	Máximo Paterno	"	11,48

195	"	"	13,7
192	D. Manuel Genaro	"	14,44
191	"	"	3,84
190	D. Manuel Perez hijo	"	7,16
188	"	"	47,74
187	"	"	3,64
186	"	"	5,2
185	"	"	27,53
184	"	"	20,20
181	Dª Leoncia Conchu	"	3,64
179	Leon Luiscuando	"	6,28
178	Lucio Ongsiaco	"	6,16
176	Luis Yangco	"	7,64
174	Lorenzo del Rosario	"	12,44
172	Luis Litonfua	"	12,24
156	José Mª Tuason	"	3,72
146	José Donelán	"	9,48
144	Juan Rodriguez	"	5,12
133	Señores Ynchausti y Compañía	"	4,52
131	Henrry Richar Coambo	"	12
130	Hilario Súnico	"	13,72
129	"	"	6,96
125	Gregorio Sanchez Giner	"	3,64
124	Gregorio Legaspi	"	6,88
123	"	"	3,68
122	"	"	5,12
121	Francisco Sainz	"	5,88
109	Federico Hidalgo	"	11,72
106	Francisco Govea	"	6,56
102	Felipe Roxas	"	14,56
101	Fernando Muñoz	"	3,96
100	Chino Elias Nubla	"	3,68
99	Enrique Debloio	"	3,8
98	Evaristo Batlle	"	5,24
96	Eusebia Olegario	"	6,16
94	Eugenia Lichauco	"	7,16
88	Eduardo Fernandez	"	5,68

87	"	"	13,96
78	Doroteo Revilla	"	3,64
69	Celso Lobregat	"	6,92
68	Ciriaca Cobarrubias	"	3,64
62	Cayetano Arellano	"	7
56	Catalino Sevilla	"	5,36
52	Concepcion Leyba	"	3,68
51	"	"	5,48
50	Cecilio Lopez	"	6,96
49	D. Cecilio Lopez	Abril a Junio 1897	7,04
40	Cornelia Lao-Changco	"	8,32
38	"	"	3,64
37	"	"	11,24
33	Braulio Mariano	"	6,92
31	Benito Legarda	"	4,04
23	Atanacia Luepangco	"	5,88
20	Adolfo Luetcuti	"	3,64
19	Antonio Boncan	"	5,52
15	Antonio Rivera	"	6,64
13	Chino Antonio Caong	"	10,4
17	Allan Boyle	"	8,36
228	Amalia Sabio	"	6,08
7	Alejo Mayde	"	6,32
135	Los herederos de D: José Juan Ycaza	"	15,25
134	Alaria de Ycaza	"	15,52
255	Nicasio Navarro	Mayo y Junio 1897	1,52
		SUMA	**912,48**
Bocas de Incencio			
147	Dª Francisca Yap de Boncan	Diciembre 96 a Junio 97	0,5
153	Cecilio Lopez	"	0,5
145	Manuel Perez	"	1
139	Mario Lafita	Noviembre 96 a Junio 97	1
135	Lorenzo del Rosario	"	1
134	Mariano Buenaventura	"	1

129	Pablo Ortega	"	1
118	Fernando Munoz	Octubre 96 a Junio 97	1
123	Chino Vicente R. Sy-Luia	"	1
114	Maria C. de Roxas	Septiembre 96 a Junio 97	1
112	Vicente Sy Luia	"	1
	Trozo		
276	D. Severo J. Villanueva	Abril a Junio 1897	4,96
271	Severino Alberto		8,68
136	Yldefonso Tambunting		3,64
108	Chino Francisco Sarvas		6,92
85	Emiliano Argüelles		3,8
26	Basilia B. Leyba		12,24
18 Recibos		**Suma**	**40,24**
Bocas de incendio			
30	Dª Maria Yeusiano	Marzo 96 a Marzo 97	1
53	Chino Francisco Sarvas	Mayo 96 a Marzo 97	1
71	Mariano del Rosario	Junio 96 a Junio 97	1
88	Pablo Ortega	Julio 96 a Junio 97	1
96	Salvador Chofre	Agosto 96 a Junio 97	2
115	Juan Alcantara	Septiembre 96 a Junio 97	1
142	Chino Francisco Sarvas	Noviembre 96 a Junio 97	1
7 Recibos		**Suma**	**8**
SAN FERNANDO DE DILAO			
14	D. Antonio Reyes Borja	Abril a Junio 97	8,96
75	Sr. Dtor. Del Manila Layson Tennis Club	"	11,15
105	D. Felipe Zamora	"	13,48
264	Rafael de yglesias	"	11,28
297	Vicente Luisino	"	11,4

214	Maximiliano Rosales	"	7,6
211	Miguel Medina	"	4,44
189	Manuel Perez	"	46,57
24 Recibos		**Suma**	**114,88**
Bocas de incendio			
17	D. Santiago Dominguez	Febrero 96 a Febrero 97	1
89	"	Julio 96 a Junio 97	1
34	La Compañía General de Tabacos	Abril 96 a Abril 97	4
72	"	Junio 96 a Junio 97	2
95	D. Ysidro Llado	Agosto 96 a Junio 97	1
5 Recibos		**Suma**	**9**

ERMITA			
Nº RECIBO	**NOMBRES**	**MESES**	**TOTAL**
303	D. Zoilo Tobillo	Abril y Junio 97	3,68
266	Rafael Ynchausti	"	37,18
244	Chino Pio Barretto	"	5,28
218	Manuel del Busto	"	17,92
210	Maria Santos viuda de Luchauco	"	8,52
170	Leon Zeus	"	8,04
161	Juan Vidal	"	12,08
120	Francisco Serratosa	"	8,52
114	Mariano Abreu	"	11,52
103	Felipe Roxas	"	7,68
76	Diego Vicente	"	8,76
8	Amalio Rosales	"	8,36
36 Recibos		**Suma**	**137,54**
Bocas de incendio			
10	Dª Vicenta O. de Pardel	Enero 96 a Enero 97	2
15	Antonio Marcaida	Febrero 96 a Febrero 97	1
16	Maria Garcia	"	1
19	Silvestre L. de Aroyave	"	2

40	Vicente Cuyugan	Abril 96 a Abril 97	1
50	Candelario de las Cajigas	Mayo 96 a Mayo 97	1
51	Ana Novales	"	1
57	¿? Marques	"	1
58	Higinio N. de Aldana	"	1
75	Jose N. ¿?	Junio 96 a Junio 97	1
83	Pantaleona Rivera	Julio 96 a Junio 97	1
84	Francisco Serratosa	"	1
93	Joaquin Elizalde	Agosto 96 a Junio 97	1
97	Melandro Grande	"	1
106	Josefa Caro y Mora	"	1
113	Miguel Ossorio	Septiembre 96 a Junio 97	1
127	Tristante Reyes	Octubre 96 a Junio 97	1
138	D. Emilio Moreta	Noviembre 96 a Junio 97	1
87	Maximiliano Rosales	Julio 96 a Junio 97	1
149	"	Diciembre 96 a Junio 97	0,5
126	"	Octubre 96 a Junio 97	1
21	Recibos	Suma	22,5
	Malate		
291	D. Vicenta Reyes	Abril a Junio 97	11,72
258	Ramon Aenlle	"	8,76
233	Sr. Nicolas Dulanto	"	11,48
175	D. Lorenzo del Rosario	17 de mayo a Junio 97	4,04
157	Joaquin Ynchausti	Abril a Junio 97	14,52
54	Concepcion Leyba	"	6,48
74	Sr. Director de la Compañía General de los Tranvías	"	25,93
20 Recibos		**Suma**	**82,93**
Bocas de incendio			
9	D. Modesto Cortabitarte	Enero 96 a Enero 97	1
21	Encarnación de Elizalde	Marzo 96 a Marzo 97	2
25	Bonifacio Alonso	"	1
26	"	"	1
41	"	Abril 96 a Abril97	1
42	"	"	1

52	"	Mayo 96 a Mayo 97	1
132	"	Noviembre 96 a Junio 97	1
133	Maximiliano Rosales	"	1
136	Cayetano Arellano	"	1
61	George Nissens	Mayo 96 a Mayo 97	1
122	Francisca Roldan	Octubre 96 a Junio 97	1
128	Lino Eguia	"	1
124	Manuel Barredo	"	1
14 Recibos		**Suma**	**15**

Sumen		**Parcial**	**Total**
18	Recibos Trozo	40,2	
7	Bocas de incendio	8	
25			**48,24**
24	San Fernando de Dilao	114,89	
5	Bocas de incendio	9	
29			**123,89**
36	Ermita	137,55	
21	Bocas de incendio	22,5	
57			**160,05**
20	Malate	82,93	
14	Bocas de incendio	15	
34			**97,93**
Total 145 Recibos		**Total**	**430,11**

Manila, 29 de noviembre de 1897
Recibí
El Cobrador
Pedro Villanueva (FIRMA)

Appendix for Chapter 7

A. Reported Number of Deaths from January to March 1864 by Manila governor Estanislao Vives

Source: Costelo, 2020. Elaborated from the reports published in Gaceta de Manila, 4 June 1864

BIRTHS AND DEATHS IN JANUARY, FEBRUARY AND MARCH. MANILA 1864														
		BIRTHS			DEATHS									
					CHILDREN		ADULTS MALE			ADULTS FEMALE			TOTAL	
							Status			Status				
		Male	Female	TOTAL	Male	Female	Single	Married	Widowed	Single	Married	Widowed		
JANUARY	**Manila**	10	12	22	1	5	1	2	1	2	0	1	13	
	Santa Cruz	35	18	53	17	16	13	2	4	6	4	7	69	
	Binondo	54	38	92	35	28	12	9	2	6	13	9	114	
	Tondo	40	54	94	51	26	5	12	1	1	2	1	28	
	Quiapo	18	14	32	12	5	3	3	1	1	2	1	28	
	San Miguel	5	11	16	10	10	1	5	2	1	1	2	32	
	Sampaloc	19	10	29	13	12	6	3	2	1	6	2	45	
	Dilao	12	15	27	10	5	2	5	2	1	5	1	31	
	Ermita	11	11	22	17	11	3	2	0	2	5	4	44	
	Malate	26	15	41	15	16	2	6	1	4	4	2	50	
	Subtotal	230	198	428	181	134	48	49	16	25	42	30	454	
FEBRUARY	**Manila**	12	8	20	3	5	1	1	1	4	2	0	17	
	Santa Cruz	19	31	50	19	18	11	2	1	5	5	3	64	
	Binondo	41	39	80	23	23	17	10	4	12	11	9	109	
	Tondo	42	32	74	30	27	2	8	8	4	10	8	107	
	Quiapo	10	3	13	11	3	4	1	2	1	3	4	29	
	San Miguel	5	6	11	5	3	1	1	0	0	2	1	13	
	Sampaloc	6	10	26	6	6	4	2	1	1	7	3	30	
	Dilao	14	20	34	11	1	3	2	1	0	0	3	21	
	Ermita	13	17	20	6	6	2	3	1	4	1	2	25	
	Malate	17	12	29	11	8	2	3	5	2	7	2	40	
	Subtotal	179	178	357	125	100	47	33	24	33	48	35	455	
MARCH	**Manila**	10	9	19	11	10	12	10	0	7	6	4	60	
	Santa Cruz	28	22	50	39	23	27	9	3	12	12	13	138	
	Binondo	50	40	90	38	42	41	23	6	24	19	20	213	
	Tondo	48	30	78	38	43	20	27	10	7	33	16	204	
	Quiapo	12	13	25	13	10	4	6	0	1	7	4	45	
	San Miguel	8	4	12	10	7	7	11	3	4	6	4	53	
	Sampaloc	10	12	22	14	10	11	8	2	6	10	4	65	
	Dilao	12	13	25	10	3	4	7	2	3	5	2	36	
	Ermita	18	15	33	14	13	12	10	8	8	4	6	75	
	Malate	26	20	46	13	12	8	10	5	4	8	1	61	
	Subtotal	222	178	400	200	173	146	121	39	76	110	74	950	

B. Reported Number of Deaths from 16 to 31 August 1882.

Source: Costelo, 2020. Elaborated from the reports published in Gaceta de Manila, 29 August 1882 and 3 September 1882.

Day (Aug)	HOSPITALS FROM WHERE THE CADAVERS CAME	CEMETERIES IN THE CAPITAL					
		Paco	**Tondo**	**Sta.Cruz**	**Sampaloc**	**Loma**	**Total**
16	Intramuros and Binondo	3	3	1	0	0	7
17	Hospital de San Juan de Dios, Hospital Militar, and Binondo	8	1	2	2	3	16
18	Hospital de San Juan de Dios, Hospital Militar, and Binondo	5	4	3	2	2	16
19	Hospital de San Juan de Dios, Intramuros, and Binondo	10	6	2	2	0	20
20	Hospital San Juan de Dios and Binondo	5	1	3	3	0	12
21	Hospital San Juan de Dios, Intramuros, Binondo, Sta. Cruz, Cathedral	11	4	1	0	1	17
22	Hospital de San Juan de Dios, Binondo, Quiapo	16	4	4	2	1	27
23	Hospital de San Juan de Dios and Binondo	0	7	0	1	1	9
	Subtotal (August 16 to 23)	51	30	15	12	9	117
24	Binondo	3	3	1	1	3	11
25	Binondo and Malate	4	3	3	2	5	17
26	Hospital de San Juan de Dios, Cathedral, and Binondo	7	1			1	9
27	Hospital de San Juan de Dios, Cathedral, and Binondo	4	4	3	1	1	13
28	Hospital de San Juan de Dios, Cathedral, and Binondo, *Castrense de Ingenieros*	8	3	1	6	2	20
29	Cathedral, Binondo, and Quiapo	9	4	1	2	1	17
30	Hospital de San Juan de Dios, Cathedral, and Binondo	6	6	1	3	1	17
31	Hospital de San Juan de Dios, Cathedral, Binondo, Quiapo	16	4	4	2	1	27
	Subtotal (August 24 to 31)	57	28	14	17	15	131
	Grand Total (Aug 16 to 31)	**108**	**78**	**29**	**29**	**24**	**248**

C. Daily Reports of Number of Deaths from 2 September 1882 to 22 September 1882

Source: Gaceta de Manila, 3 September 1882 to 23 September 1882

SEPTEMBER 2	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	4	2	0	0	0	0	0	0	0	11	9	2	0	28
Tondo	0	0	60	40	0	0	0	0	0	3	4	0	0	107
Santa Cruz	0	0	7	7	0	0	0	0	0	4	4	0	0	22
Sampaloc	0	0	6	6	0	0	0	0	0	3	3	0	0	18
Loma (Chinese)	0	0	0	0	0	0	40	0	0	0	0	0	0	40
Ermita	0	0	2	2	0	0	0	0	0	1	0	0	0	5
Malate	0	0	2	2	0	0	0	0	0	2	2	0	0	8
San Fernando de Dilao	0	0	3	1	0	0	0	0	0	1	0	0	0	5
Total	4	2	80	58	0	0	40	0	0	25	22	2	0	233

SEPTEMBER 3	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	6	5	0	0	0	0	0	2	1	0	0	14
Tondo	0	0	36	25	0	0	0	0	0	3	1	0	0	65
Santa Cruz	0	0	16	6	0	0	0	0	0	1	3	0	0	26
Sampaloc	0	0	12	5	0	0	0	0	0	2	1	0	0	20
Loma (Chinese)	0	0	0	0	0	0	24	0	0	0	0	0	0	24
Ermita	0	0	5	3	0	0	0	0	0	1	1	0	0	10
Malate	0	0	3	1	0	0	0	0	0	0	0	0	0	4
San Fernando de Dilao	0	0	3	2	0	0	0	0	0	1	1	0	0	7
Total	0	0	81	47	0	0	24	0	0	10	8	0	0	170

SEPTEMBER 4	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	16	5	1	0	0	1	0	2	2	0	0	27
Tondo	0	1	20	14	3	3	0	0	0	13	5	2	1	62
Santa Cruz	1	0	15	5	1	0	0	0	0	2	3	0	0	27
Sampaloc	0	1	8	6	1	1	0	0	0	1	1	1	0	20
Loma (Chinese)	0	0	0	0	0	0	17	0	0	0	0	0	0	17
Ermita	0	0	1	2	0	0	0	0	0	0	1	0	0	4
Malate	0	0	1	1	0	0	0	0	0	0	2	0	0	4
San Fernando de Dilao														0
Total	1	2	61	33	6	4	17	1	0	18	14	3	1	161

SEPTEMBER 5	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	2	0	30	12	0	0	0	0	0	1	1	0	0	46
Tondo	0	0	30	20	0	0	0	0	0	2	1	0	0	53
Santa Cruz	0	0	12	10	0	0	0	0	0	1	1	0	0	24
Sampaloc	0	0	12	6	0	0	0	0	0	2	2	0	0	22
Loma (Chinese)	0	0	0	0	0	0	26	0	0	0	0	0	0	26
Ermita	0	0	4	2	0	0	0	0	0	1	1	0	0	8
Malate	0	0	4	3	0	0	0	0	0	0	0	0	0	7
San Fernando de Dilao														0
Total	2	0	92	53	0	0	26	0	0	7	6	0	0	186

SEPTEMBER 6	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	1	10	4	0	0	0	2	0	4	3	0	0	24
Tondo	0	0	18	13	1	1	0	0	0	8	5	0	0	46
Santa Cruz	0	0	4	6	1	1	0	0	1	2	3	1	1	20
Sampaloc	0	0	4	2	0	0	0	0	0	1	2	1	0	10
Loma (Chinese)	0	0	0	0	0	0	16	0	0	0	0	0	0	16
Ermita	0	0	2	2	0	0	0	0	1	0	0	0	0	5
Malate	0	0	2	2	0	0	0	0	0	0	0	0	0	4
San Fernando de Dilao														0
Total	0	1	40	29	2	2	16	2	2	15	13	2	1	125

SEPTEMBER 7	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	11	4	0	0	0	1	0	1	1	0	0	18
Tondo	0	0	10	15	0	0	0	0	0	9	7	1	0	42
Santa Cruz	0	0	3	3	1	4	0	0	0	2	1	1	1	16
Sampaloc	0	0	5	1	1	1	0	0	0	2	0	0	0	10
Loma (Chinese)	0	0	0	0	0	0	21	0	0	0	0	0	0	21
Ermita	0	0	4	0	0	0	0	0	0	2	0	0	0	6
Malate	0	0	1	1	0	1	0	0	0	1	1	0	0	5
San Fernando de Dilao	0	0	2	1	0	0	0	0	0	0	1	0	0	4
Total	0	0	36	25	2	6	21	1	0	17	11	2	1	122

SEPTEMBER 8	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	3	0	2	1	0	0	0	0	0	1	0	0	0	7
Tondo	0	0	12	9	1	1	0	0	0	2	1	1	1	28
Santa Cruz	0	0	5	6	1	1	0	0	0	3	1	1	1	19
Sampaloc	0	0	5	6	1	1	0	0	0	1	1	0	1	16
Loma (Chinese)	0	0	0	0	0	0	31	0	0	0	0	0	0	31
Ermita	0	0	1	4	0	0	0	0	0	1	1	0	0	7
Malate	0	0	1	1	0	0	0	0	0	1	1	0	0	4
San Fernando de Dilao	0	0	1	1	0	0	0	0	0	0	1	0	0	3
Total	3	0	27	28	3	3	31	0	0	9	6	2	3	115

SEPTEMBER 9	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	2	3	3	1	0	0	0	0	0	1	0	0	0	10
Tondo	0	0	7	8	1	1	0	0	0	8	3	0	0	28
Santa Cruz	0	0	4	3	0	1	0	0	0	3	1	1	0	13
Sampaloc	0	0	1	1	0	0	0	0	0	1	0	0	0	3
Loma (Chinese)	0	0	0	0	0	0	24	0	0	0	0	0	0	24
Ermita	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Malate	0	0	1	1	0	0	0	0	0	0	1	0	0	3
San Fernando de Dilao	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Total	2	3	18	14	1	2	24	0	0	13	7	1	0	85

SEPTEMBER 10	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	3	0	0	0	0	0	0	1	0	0	0	4
Tondo	0	0	9	10	0	0	0	0	0	2	2	0	0	23
Santa Cruz	0	0	6	3	0	0	0	0	0	0	1	0	0	10
Sampaloc	0	0	6	3	0	0	0	0	0	0	0	0	0	9
Loma (Chinese)	0	0	0	0	0	0	34	0	0	0	0	0	0	34
Ermita	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Malate	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Fernando de Dilao	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Total	0	0	24	20	0	0	34	0	0	3	3	0	0	84

SEPTEMBER 11	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	1	0	6	1	1	0	0	0	0	1	0	0	0	10
Tondo	0	0	8	9	1	2	0	0	0	4	5	2	1	32
Santa Cruz	0	0	4	2	1	0	0	0	0	0	1	0	0	8
Sampaloc	0	0	1	1	1	1	0	0	0	0	0	0	0	4
Loma (Chinese)	0	0	0	0	0	0	20	0	0	0	0	0	0	20
Ermita	0	0	3	1	0	0	0	0	0	0	0	0	0	4
Malate	0	0	3	3	0	0	0	0	0	0	0	0	0	6
San Fernando de Dilao	0	0	2	1	0	0	0	0	0	0	0	0	0	3
Total	1	0	27	18	4	3	20	0	0	5	6	2	1	87

SEPTEMBER 12	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	1	5	1	0	0	0	1	0	1	0	0	0	9
Tondo	0	0	2	3	1	1	0	0	0	2	2	0	0	11
Santa Cruz	0	0	1	2	1	2	0	0	0	2	0	0	0	8
Sampaloc	0	0	0	1	0	1	0	0	0	1	0	0	0	3
Loma (Chinese)	0	0	0	0	0	0	25	0	0	0	0	0	0	25
Ermita	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Malate	0	0	2	2	0	0	0	0	0	0	0	0	0	4
San Fernando de Dilao	0	0	1	0	0	0	0	0	0	1	0	0	0	2
Total	0	1	12	9	2	4	25	1	0	7	3	0	0	64

SEPTEMBER 13	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	4	0	0	0	0	0	0	0	1	0	0	5
Tondo	0	0	8	7	1	0	0	0	0	7	1	1	0	25
Santa Cruz	0	0	2	4	1	0	0	0	0	1	1	0	0	9
Sampaloc	0	0	2	1	0	0	0	0	0	0	3	0	0	6
Loma (Chinese)	0	0	0	0	0	0	19	0	0	0	0	0	0	19
Ermita	0	0	1	1	0	0	0	0	0	1	0	0	0	3
Malate	0	0	2	1	0	0	0	0	0	1	0	0	0	4
San Fernando de Dilao	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	19	14	2	0	19	0	0	10	6	1	0	71

SEPTEMBER 14	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Tondo	0	0	2	2	0	1	0	0	0	10	1	0	0	16
Santa Cruz	0	0	1	1	0	0	0	0	0	0	1	0	0	3
Sampaloc	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Loma (Chinese)	0	0	0	0	0	0	11	0	0	0	0	0	0	11
Ermita	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Malate	0	0	1	1	0	0	0	0	0	0	1	0	0	3
San Fernando de Dilao	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	8	7	0	1	11	0	0	10	3	0	0	40

SEPTEMBER 15	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Tondo	0	0	4	2	0	0	0	0	0	2	2	0	0	10
Santa Cruz	0	0	2	1	0	0	0	0	0	1	0	0	0	4
Sampaloc	0	0	1	1	0	0	0	0	0	1	0	0	0	3
Loma (Chinese)	0	0	0	0	0	0	21	0	0	0	0	0	0	21
Ermita	0	0	2	0	0	0	0	0	0	1	0	0	0	3
Malate	0	0	0	0	0	1	0	0	0	0	0	0	0	1
San Fernando de Dilao	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	11	5	0	1	21	0	0	5	2	0	0	45

SEPTEMBER 16	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	1	2	0	0	0	0	0	0	0	0	0	3
Tondo	0	0	6	4	0	0	0	0	0	2	0	0	0	12
Santa Cruz	0	0	3	5	0	0	0	0	0	0	0	0	0	8
Sampaloc	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Loma (Chinese)	0	0	0	0	0	0	11	0	0	0	0	0	0	11
Ermita	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malate	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Fernando de Dilao	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	12	11	0	0	11	0	0	2	0	0	0	36

SEPTEMBER 17	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	1	1	0	0	0	0	0	1	0	0	0	3
Tondo	0	0	2	1	1	0	0	0	0	1	1	0	0	6
Santa Cruz	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Sampaloc	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Loma (Chinese)	0	0	0	0	0	0	9	0	0	0	0	0	0	9
Ermita	0	0	0	1	0	0	0	0	0	0	1	0	0	2
Malate	0	0	0	2	0	0	0	0	0	0	0	0	0	2
San Fernando de Dilao	0	0	2	0	0	0	0	0	1	0	0	0	0	3
Total	0	0	7	5	1	0	9	0	1	2	3	0	0	28

SEPTEMBER 18	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Tondo	0	0	1	2	1	1	0	0	0	0	3	0	0	8
Santa Cruz	0	0	0	1	0	0	0	0	0	0	1	0	0	2
Sampaloc	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Loma (Chinese)	0	0	0	0	0	0	10	0	0	0	0	0	0	10
Ermita	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malate	0	0	2	1	0	0	0	0	0	0	0	0	0	3
San Fernando de Dilao	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	6	4	1	1	10	0	0	0	5	0	0	27

SEPTEMBER 19	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	2	1	0	0	0	0	0	0	0	0	0	3
Tondo	0	0	1	1	0	3	0	0	0	1	1	0	0	7
Santa Cruz	0	0	1	1	1	0	0	0	0	0	1	0	0	4
Sampaloc	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Loma (Chinese)	0	0	0	0	0	0	8	0	0	0	0	0	0	8
Ermita	0	0	1	0	0	0	0	0	0	1	0	0	0	2
Malate	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Fernando de Dilao	0	0	0	1	0	0	0	0	0	1	0	0	0	2
Total	0	0	7	4	1	3	8	0	0	3	2	0	0	28

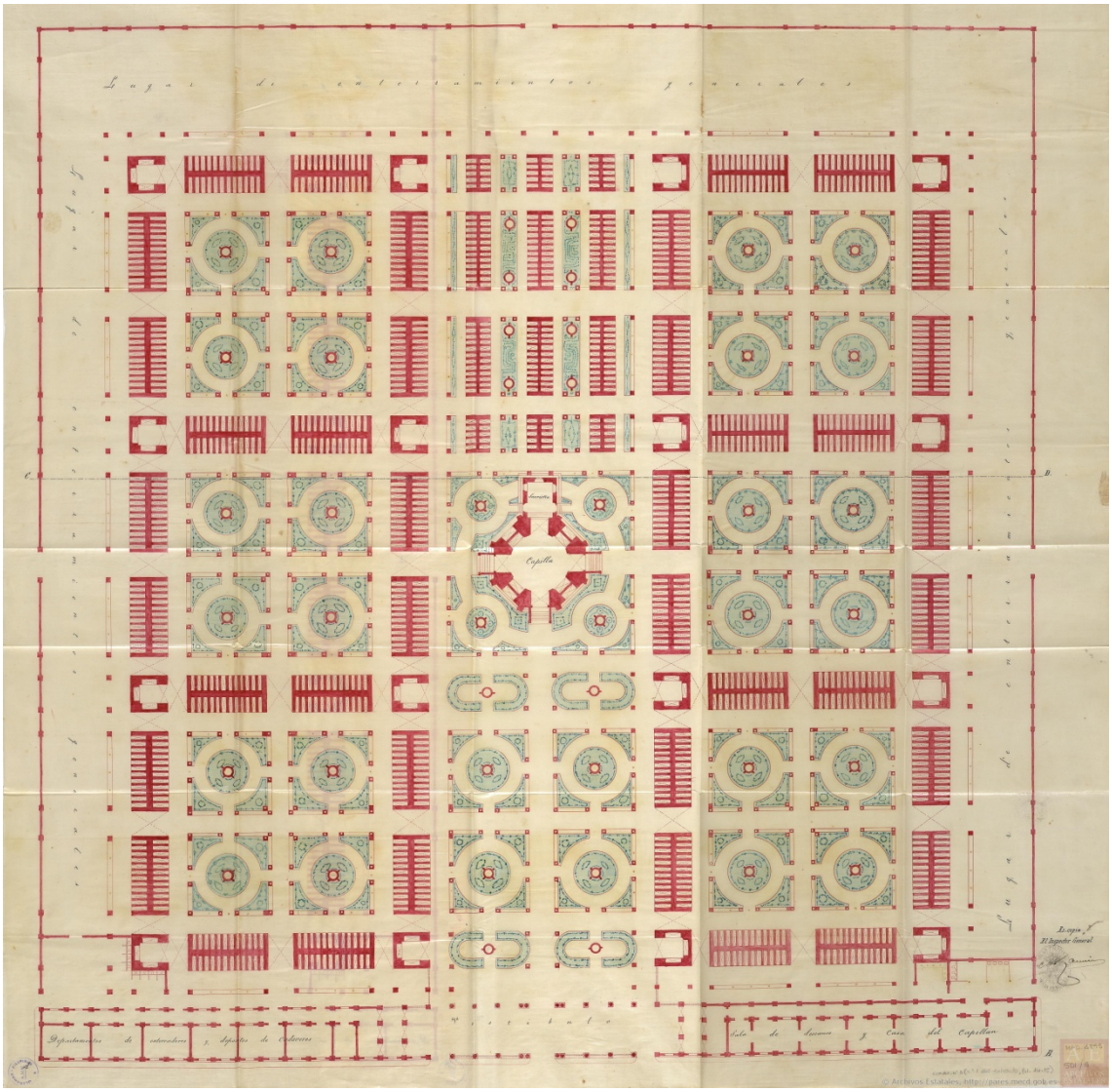
SEPTEMBER 20	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Tondo	0	0	1	2	0	1	0	0	0	1	1	0	0	6
Santa Cruz	0	0	1	0	0	0	0	0	0	1	1	0	0	3
Sampaloc	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Loma (Chinese)	0	0	0	0	0	0	11	0	0	0	0	0	0	11
Ermita	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Malate	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Fernando de Dilao	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Total	0	0	5	5	0	1	11	0	0	2	2	0	0	26

SEPTEMBER 21	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tondo	0	0	2	1	0	0	0	0	0	1	1	0	0	5
Santa Cruz	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Sampaloc	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Loma (Chinese)	0	0	0	0	0	0	9	0	0	0	0	0	0	9
Ermita	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Malate	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Fernando de Dilao	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loma (General Cemetery)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paco (Niches)	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Total	0	0	4	5	0	0	9	0	0	2	1	0	0	21

SEPTEMBER 22	ADULTS						CHINESE	CHILDREN						TOTAL
CEMETERIES	SPANISH		NATIVE INDIOS		MESTIZOS			SPANISH		NATIVE INDIOS		MESTIZOS		
	MEN	WOMEN	M	W	M	W		M	W	M	W	M	W	
Paco (General Cemetery)														0
Tondo														0
Santa Cruz														0
Sampaloc														0
Loma (Chinese)														0
Ermita														0
Malate														0
San Fernando de Dilao														0
Loma (General Cemetery)														
Paco (Niches)														
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0

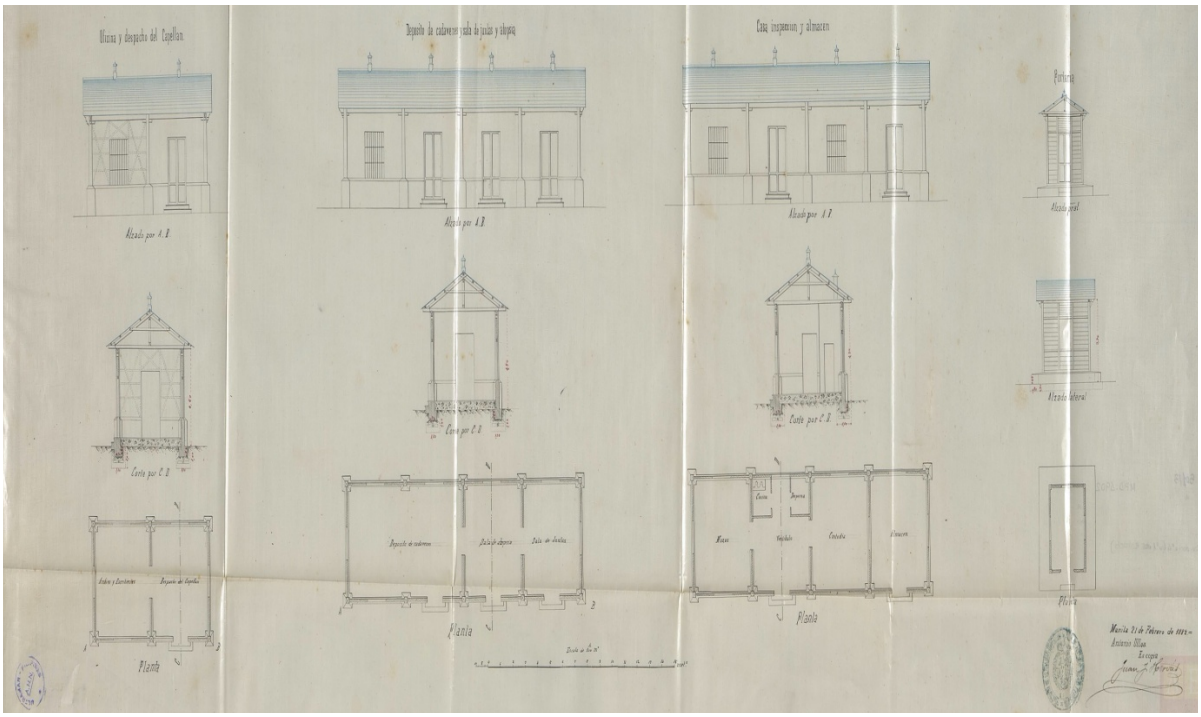
D. Cemetery design that accompanied the plan for the proposed lands to the north of the San Lazaro Hospital to be acquired for the construcción of a new cemetery, 1868.

Source: AHN, Ultramar, MPD. 4895. Proyecto de adquisición de terreno para la construcción de un nuevo Cementerio en Manila: Plano general.

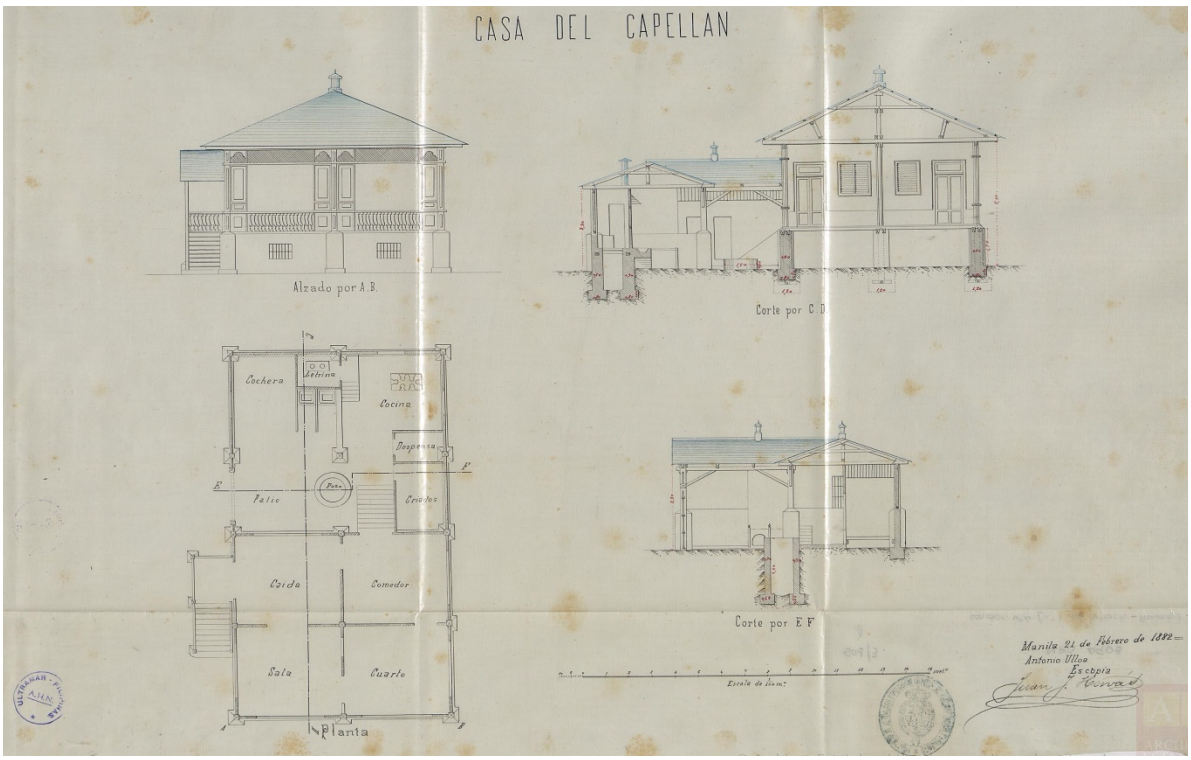


E. Additional plans for the other structures of the proposed La Loma Cemetery by Antonio Ulloa, 1882.

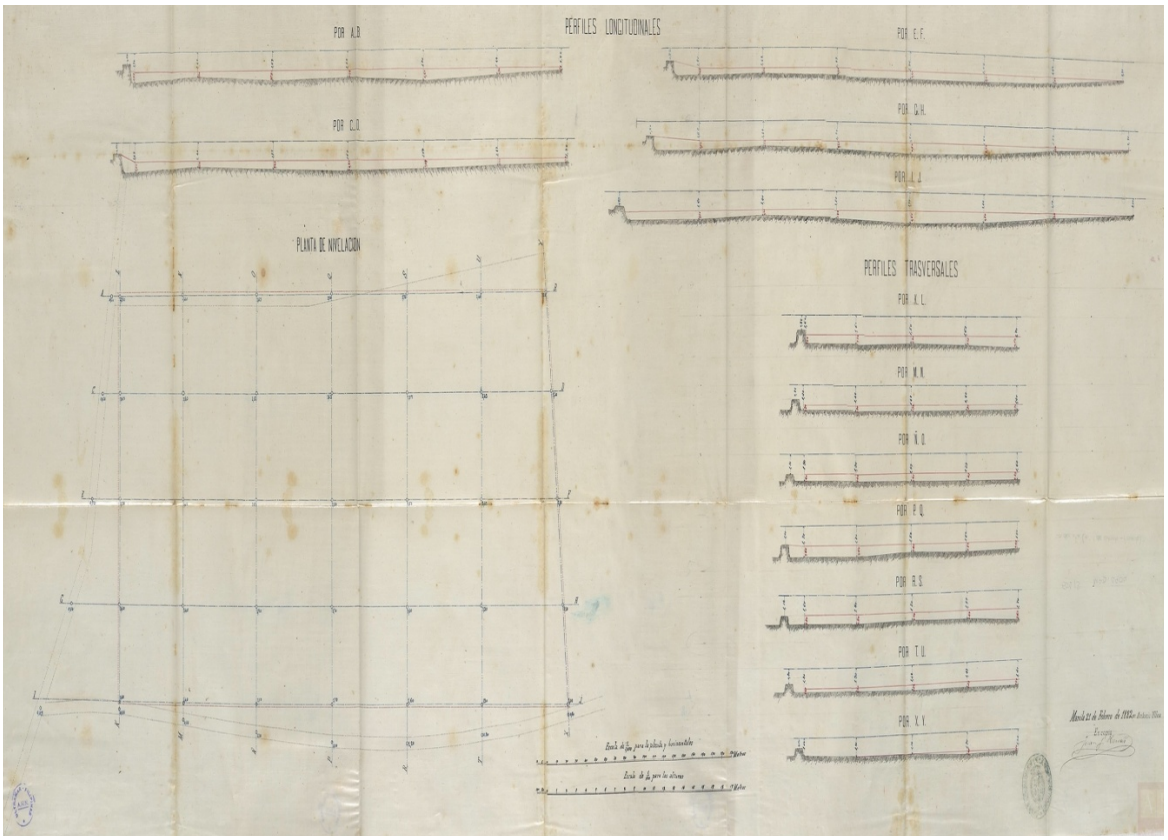
Source. AHN, Ultramar, MPD. 4902, 4903, and 4904.



AHN, Ultramar, MPD.4902. Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 5ª: Oficina del capellán, depósito de cadáveres, casa inspección, almacén y portería.



AHN, Ultramar, MPD.4903. Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 6ª: "Casa del capellán".



AHN, Ultramar, MPD.4904. Proyecto de construcción de un nuevo cementerio para Manila y sus arrabales: Hoja 7ª: Nivelación.